THE IRON TRADE REVIEW

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Continued Improvement in Finished Lines

And More Interest in Pig Iron—Old Material Market Stronger—Exports in Good Volume—Buying by Railroads

Distinct signs of improvement continue. Even in the pig iron market, which has lagged far behind finished material, there is increased interest, and the scrap market in some centers is much stronger. Bookings of new business of the Steel Corporation for the first week in February have sustained the improved record of January, and have averaged above 30,000 tons daily. Its new orders are well distributed, but especially good in rails, tin plate, and in export trade. Export tonnage is running strong. Several five and ten thousand-ton orders of different products were booked this week.

Pig Iron Output

The production of coke and anthracite pig iron in January amounted to 1,766,658 tons, a loss of 13,241 tons compared with December. There were 210 stacks in blast on Jan. 31, compared with 193 on the last day of December. Most of the stacks blown in were by steel making companies. The outlook is that February production will show a considerable increase over January. Pig iron stocks in the middle west on Feb. 1 amounted to about 900,000 tons, outside of the Steel Corporation, which now has on hand about 200,000 tons. Blast furnace operations of the Corporation at the beginning of the week were approximately 56 per cent, which represents an increase of about 10 per cent in the past three weeks. Several additional furnaces will be blown in within the next few days, and it is expected that 60 per cent of capacity will be active by the close of the week. Finishing mill operations are running in line with blast furnace activity, and the demands for steel continue to work a gradual reduction in pig iron stocks.

Pig Iron

Negotiations for from 50,000 to 60,000 tons of basic pig iron have been pending in the valleys, but have been terminated for the present at least. It developed that some large buyers are willing to pay $13.50, valley, but were unable to get the desired tonnage at that figure in spite of the fact that two sales amounting to 6,000 tons were made at $13.25, valley. The company which made these sales is now asking $14, and the basic market is firmer. Although there is a large tonnage of basic in furnace yards in the valleys, it is held by a few interests, and the present outlook is that prices will be higher. The leading cast iron pipe company has purchased 40,000 tons of lower foundry grades. The Steel Corporation has contracted for 5,000 tons of 50 per cent ferro-silicon for delivery this year. Some very low prices are being made on foundry grades at Buffalo, especially for delivery in eastern territory, and some eastern Pennsylvania furnaces are meeting the Buffalo competition.

Railroad Buying

Of the 70,000 tons of steel rails ordered by the Boston & Maine and affiliated lines, one-half will be rolled by the Pennsylvania Steel Co., and the remainder by the Bethlehem and Lackawanna Steel Companies. The Delaware, Lackawanna & Western has ordered 20,000 tons, divided among the same steel companies, and the Bangor and Aristook is negotiating for 3,500 tons. The Illinois Steel Co. officially reports the receipt of 80,000 open-hearth and 40,000 Bessemer steel rails representing allotments on contracts recently closed. This total includes 65,500 for the New York Central, 25,300 for the Pennsylvania, 10,000 for the Burlington, 10,000 for the Rock Island, 4,000 for the Chesapeake & Ohio of Indiana, 4,000 for the C. & O. proper, and some scattered lots. The Carnegie Steel Co. reports 10,000 Bessemer and open-hearth for the Pittsburg & Lake Erie, a part of New York Central purchase. The Tennessee Coal, Iron & Railroad Co., 1,500 scattering. The Interborough Rapid Transit Co. has placed 4,000 tons with the Lackawanna Steel Co. The Pittsburg, Shawmut & Northern has ordered 2,000 all-steel cars. The Pennsylvania railroad will build 1,000 steel gondolas, 50 all-steel passenger cars, nine all-steel dining cars and seven all-steel postal cars at its Altoona, Pa., shops. Some large bridge tonnage has been booked by the American Bridge Co. for Mexican railways, to replace the structures demolished by recent floods. The Grand Trunk and Canadian Pacific are still negotiating for large tonnages of steel rails. The former has entered the market for 7,500 tons for delivery in this country, which will go to domestic mills.

WORLD'S IRON MARKETS

PITTSBURG

Advance in Tin Plate and Scrap—General Improvement Continues.

Office of THE IRON TRADE REVIEW,
510 Park Building, Feb. 7.

An advance of 10 cents per base box in the price of tin plate; an advance of from 25 cents to $1 a ton in the price of scrap, more general buying of all finished iron and steel products and the starting of additional mills are among the more important developments in the Pittsburg territory during the past week. Further evidence of the general improvement in market conditions is given in the larger volume of business being booked by practically all steel mills. Consumers, however, are buying conservatively. Orders are coming from a wide range of customers and specifications during the first seven days of February have been slightly heavier than for any single week in January. The railroads have adopted a more liberal buying policy and the announcement that the interstate commerce commission will hand down a decision late this month regarding the proposed advance in freight rates is expected to bring about a still further increase in buying on the part of transportation companies.

The advance in the price of tin plate was not unexpected and some of the independents are understood to have favored a greater advance than that announced last week. Consumers are asking for immediate shipment of tin plate against contracts and mill operations this week are understood to represent about 90 per cent of the total available capacity of the leading interest and independents. Upward of 15,000 tons of heavy melting steel has been sold this week at an advance of from 25 cents to $1 a ton over quotations established by recent sales. Inquiry for all grades of scrap is heavier. The Cambria Steel Co. will roll 17,000 tons of plates and shapes to be used in boat construction by the Great Lakes Engineering Works, Detroit, about 8,500 tons of which will be used in the building of two large boats for the Shenango Steamship Co. The Carnegie Steel Co. will furnish upward of 5,000 tons of plates for gas holder construction in the west, for which the Riter-Conley Mfg. Co., Pittsburg, has the general contract. The American Bridge Co. has the contract for two foundry buildings to be erected at Trafford City, Pa., for the Westinghouse Electric & Mfg. Co., involving 3,000 tons of steel. Heavy tonnage of pipe is involved in recent sales and in inquiries now pending. An eastern gas interest has placed an order with an independent mill for 30 miles of 10 and 12-inch steel pipe and a local gas company has divided orders among several mills for 5,000 tons of iron pipe. Bids will close Friday of this week on an inquiry for 80 miles of from 2 to 16-inch steel pipe. The United States Steel Corporation has closed for 5,000 tons of 50 per cent ferro-silicon for delivery this year.

Pig Iron.—The pig iron market is quiet as far as actual sales are concerned, but consumers of basic and foundry iron are quietly sounding the market and there is heavy tonnage under negotiation. There is less talk of low prices and in some quarters sellers are not inclined to sell very far ahead at today's prices. A valley furnace interest sold 6,000 tons of basic at $13.25, valley, 5,000 tons to a steel casting interest and 1,000 to a steel company. The United Steel Co., Canton, O., is in the market for 3,000 tons of basic for delivery during March and April. All sorts of reports regarding the price of basic iron have been circulated during the past month. Some reports have it that this grade has been sold below $13.25, valley, while most furnaces are holding for $14 and one interest will not sell below $14.50, valley, for all deliveries. Early last month a steel car company bought 3,000 tons of basic at less than $13.25, valley, but special conditions were involved, and, with the exception of the sale of 6,000 tons by a valley interest, noted above, no sales of basic have been reported below $13.50, valley.

A local consumer has taken 600 tons of No. 2 foundry iron at $14, valley, and two inquiries, each involving 500 tons of this grade, are pending. No sales of malleable have been reported, and while $13.50, valley, has been done, sales have also been made at $13.75, valley. Gray forge is still selling around $13.25, valley, for all deliveries. Demand for Bessemer iron is light, but no sales have been reported below $15, valley.

Three blast furnaces at the Edgar Thomson works of the Carnegie Steel Co. have been started since last Friday, only two of the 11 stacks at that point being idle. Two or three additional furnaces at other plants of this company have been blown in. The Cambria Steel Co., Johnstown, on Feb. 5, started one stack and will likely blow in another furnace this week. The company will then have seven of its eight blast furnaces in service. The Kittanning, Pa., furnace of the Kittanning Iron & Steel Co. was blown in this week and the Clinton stack of the Clinton Iron & Steel Co., Southside, Pittsburg, likely will be started within a few days. We quote the market as follows:

Pig Iron Prices.

(Prompt Shipment.)

Bessemer, valley	$15.00
Bessemer, Pittsburg	15.90
Basic, valley	13.25
Basic, Pittsburg	14.15
No. 2 foundry, Pittsburg	14.65
Gray forge, Pittsburg	14.15
Malleable, Pittsburg	14.40

(First Half.)

Bessemer, valley	$15.00
Bessemer, Pittsburg	15.90
Basic, valley	13.50
Basic, Pittsburg	14.40
No. 2 foundry, Pittsburg	14.90
Gray forge, Pittsburg	14.15
Malleable	14.40

Ferro-Alloys. — The United States Steel Corporation has closed for upward of 5,000 tons of foreign 50 per cent ferro-silicon for delivery over the remainder of the year, this being the largest transaction of this character in several months. The price paid is understood to have been $55, Pittsburg, and the market is firm at this figure. There is little demand for ferro-manganese and quotations as low as $37.50, Baltimore, have been made on recent inquiries for small lots.

We quote ferro-manganese at $37.50 to $38, Baltimore, for prompt and first half of 1911. The freight rate from Baltimore to Pittsburg is $1.95 per ton.

Fifty per cent ferro-silicon is quoted at

$55. Pittsburg, for prompt and first half; 12 per cent, $25; 11 per cent, $24; 10 per cent, $23, f. o. b. Jisco and Ashland furnaces. The freight rate to Pittsburg is $1.90. The foreign grades are held at $1 or more a ton over domestic prices.

Plates.—A more optimistic feeling is noted in this market, as a result of heavier specifications for plates and the more general inquiry for freight cars. All reports of price concessions have disappeared and the market is firm at 1.40c, Pittsburg. The Riter-Conley Mfg. Co., Pittsburg, has received two large contracts for gas holder construction recently, involving upward of 5,000 tons of plain material, which will be furnished by the Carnegie Steel Co., Pittsburg. One of the contracts is for a gas holder of 5,000 cubic feet capacity for the Minneapolis Gas Light Co., and the other a gas holder of 3,000,000 cubic feet capacity for the Laclede Gas Light Co., St. Louis. The Pittsburg, Shawmut & Northern Railroad Co. has ordered 2,000 all-steel freight cars, of which 500 will be built by the Pressed Steel Car Co. and 1,500 by the American Car & Foundry Co. The inquiry of the Buffalo, Rochester & Pittsburg Railroad Co. for 2,500 cars has been withdrawn. The Pennsylvania Railroad Co. has authorized the construction of 1,000 gondola steel cars, 50 all-steel passenger coaches, 9 all-steel dining cars and 7 all-steel postal cars at its Altoona, Pa., shops. Receiver Henry W. McMaster, of the Wabash, Pittsburg Terminal Railroad Co., has been authorized by the courts to dispose of receiver's certificates in the sum of $1,000,000 to pay for 1,000 steel freight cars and to purchase 1,000 additional cars, should conditions justify it. The Cambria Steel Co., Johnstown, Pa., has received an order for 17,000 tons of plates and shapes from the W. P. Snyder interest, Pittsburg, which will be used in boat construction by the Great Lakes Engineering Works, Detroit. We quote the market as follows:

Tank plates, ¼ inch thick, 6¼ to 100 inches, 1.40c. Extras are as follows, per 100 pounds: Boiler and flange steel plates, 0.10c; A. B. M. and ordinary firebox steel plates, 0.20c; still bottom steel, 0.20c; marine steel, 0.40c; locomotive firebox steel, 0.50c; all sketches excepting straight taper plates varying not more than 4 inches in width at ends, narrowest end not being less than 30 inches, 0.10c; circles, 0.20c. Plates in widths over 100 inches up to 110 inches, 0.05c; over 110 inches up to 115 inches, 0.10c; over 115 inches up to 120 inches, 0.15c; over 120 inches up to 125 inches, 0.25c; over 125 inches up to 130 inches, 0.50c; over 130 inches, 1c. Gages under ¼ inch to and including 3-16 inch plate on thin edge, 0.10c; under 3-16 and including No. 9, 0.25c. Five cents extra for less than carloads. Terms net cash in 30 days.

Sheets.—Further activity in the market on sheets is noted, although the total volume of business booked so far this year is not very heavy and sheet mill operations have not been increased to any great extent during the past few weeks. Since Feb. 1 inquiry has been heavier and users are requesting prompt shipment on contracts previously made. It is expected that several additional mills will be started within the next 10 days. Prices are firm. We quote prices as follows, with $1 a ton added as the delivered price in the Pittsburg district:

Blue annealed sheets, No. 10 gage, 1.65c; box annealed sheets, No. 28 gage, 2.20c; galvanized sheets, No. 28 gage, 3.20c; painted roofing sheets, 1.55c per square for No. 28 gage, 2½-inch corrugation; galvanized roofing sheets, 2.75c per square for No. 28 gage, 2½-inch corrugation.

Tin Plate.—The American Sheet & Tin Plate Co. and all independent manufacturers on Feb. 3 advanced the price of tin plate 10 cents per base box, or $2 a ton, the new quotation being $3.70, Pittsburg, per 100-pound box. In addition to the above advance on all coated products, there has been a special advance on several medium grades of terne plate and all charcoal plate. The readjustment upward of differentials on the two last named grades has been expected for some time, as it was generally conceded that these prices were out of line. The advance in the price of tin plate was not unexpected and is understood to have been made as a result of the advance in the market price of pig tin. In some quarters it is stated that independents favored an advance of 25 cents per base box and it is intimated that another advance may follow, although these reports cannot be confirmed. On Sept. 28, 1909, the price of tin plate was advanced to $3.50, Pittsburg, per 100-pound box. On Nov. 11, 1909, the price was advanced to $3.60, Pittsburg, per 100-pound box, this being the only finished line on which the price was maintained throughout the year 1910. The tin plate market as a whole is showing more activity than any other finished line. It is estimated that the tin plate industry is running at about 90 per cent of the total available capacity of the leading interest and independents. Consumers are requesting prompt shipment on contracts previously placed and are gradually increasing specifications. The base price on tin plate is as follows:

Coke tin plate, 10-pound basis, 14 x 20, $3.70, f. o. b. mill, Pittsburg district.

Rails and Track Material.—Rail mills in this section are operating to greater capacity than for several months. In addition to the several large orders placed recently, there is a fair volume of miscellaneous orders for standard rails being booked. Bookings of light rails also show a slight gain, orders coming from various sections of the country. The buying of spikes and track bolts continues moderately heavy and prices are firm. Manufacturers have adopted a new schedule of prices, eliminating the former differential of 10 cents per keg in favor of the smaller sized railroad spikes. The new card follows:

RAILROAD SPIKES.

4½, 5 and 5½ x ⅜	$1.55
3, 3½, 4, 4½ and 5 x ½	.10
3½, 4 and 4½ x ⅜	.20
3, 3½, 4 and 4½ x ⅜	.30
2½ x ⅜	.40
2½, 3 and 3½ x ⅜	.60
2 x ⅜	.80

BOAT SPIKES.

¾-inch. square, 12 to 24-inch. long	$0.15
⅝-inch. square, 8 to 16-inch. long	.15
½-inch. square, 6 to 16-inch. long	.15
⅜-inch. square, 6 to 12-inch. long	.20
⅜-inch. square, 4 to 12-inch. long	.30
⅜-inch. square, 4 to 8-inch. long	.45
¼-inch. square, 4 to 8-inch. long	.75
¼-inch. square, 3 to 3½-inch. long	1.00

⅜ and ⅜ shorter than 4 inches, ¼ cent extra.

We quote the market as follows, the base price on open-hearth rails being 1,34c per pound, at the mill:

Fifty-pound and heavier, 1.25c per pound; car-loads and less than 500 tons, 1.34c per pound; light rails on base weight of 40 to 45 pounds, $26.50 to $27, the schedule on the other weights being irregular and subject to negotiations; angle splice bars for standard sections, 1.50c, Pittsburg; track bolts, 2.30c, Pittsburg.

Steel.—Mill operations have been increased materially during the past few weeks on account of the increased demand for semi-finished steel. All large consumers are covered by contract and as a result there is litle trading in the open market. Prices are absolutely firm and most mills will not quote present prices for delivery beyond the next two or three months. Forging billets are held firmly with $28, Pittsburg, as the minimum. The Republic Iron & Steel Co. is operating its steel mills full time again this week. The Cambria Steel Co., Johnstown Pa., will start two additional open-hearth furnaces, making a total of 18 out of 24 open-hearth furnaces in service and the Carnegie Steel Co. is also operating some of its steel mills full time. We quote the market as follows, showing extras on forging steel:

EXTRAS FOR FORGING STEEL.

Large size forging bloom extras:	12,000 lbs. and under, each.	Over 12,000 lbs. each.
Up to but not including 10 x 10-inch	$ 5.00	
10 x 10-inch up to but not including 16 x 16-inch	7.00	$14.00
16 x 16-inch up to but not including 20 x 20-inch	9.00	16.00
20 x 20-inch up to and including 24 x 24-inch	11.00	18.00

For slabs, charge the above extras for equiv-

alent sectional area, and for slabs of greater equivalent area than 24 x 24-inch, charge above extras for 24 x 24-inch blooms.

Usual carbon differentials and other extras as provided in the billet schedule to be added in addition to the above extras for forging quality.

Bessemer 4 x 4 billets with 0.25 carbon and less are quoted at $23, with the usual extras for size and analysis, and open-hearth rolling billets, $23. Forging billets are quotable at $28, Pittsburg. Bessemer sheet and tin bars are quoted at $24, and open-hearth sheet bars are quoted at $24, makers' mill, Pittsburg or Youngstown, with full freight to destination added.

Hoops and Bands.—Specifications and new business are moderately heavy and prices are firm. Mills are operating on practically the same basis as a month ago. We quote the market as follows:

Hoops in carload lots, 1.50c; in less than carload lots, 1.65c; bands, 1.40c, base, with net extras, as per standard steel.

Merchant Bars.—There is a fair volume of new business in steel bars appearing and specifications from railroads and other users are somewhat heavier, with the result that manufacturers are not quoting today's prices for delivery beyond July 1. Users are beginning to figure further ahead on their requirements and mills are assured steady operation at the present rate throughout the month. While low prices are still being quoted by some mills outside of the Pittsburg district on bar iron, manufacturers report heavier shipments this month. Inquiry for shafting is somewhat heavier and specifications against old contracts are more liberal. We quote the market as follows:

Common iron bars, 1.35c to 1.40c, Pittsburg; Bessemer and open-hearth steel bars, 1.40c; plow and cultivator, 1.40c; channels, angles, zees, tees, under 3-inch, 1.50c, all f. o. b. mill. The following differentials are maintained on steel: Less than 2,000 pounds of a size, 0.35c advance. Cold rolled and ground shafting, 55 per cent in carloads and 50 per cent in less than carloads, delivered in base territory.

Muck Bar.—There has been no important trading in this market, although a slightly better feeling is noted in some sections. We quote the best grades of muck bar nominally at $29, Pittsburg, although some mills will not accept business at this figure.

Structural.—Local steel makers report a fair run of orders for structural steel and fabricating shops have more work on hand than for some time. The American Bridge Co. has been awarded a contract for two foundry buildings for the Westinghouse Electric & Mfg. Co., at Trafford City, Pa., which will require approximately 3,000 tons of steel. The Pittsburg Bridge & Iron Works will fabricate 345 tons of steel for the new buildings of the Orenstein-Arthur Koppel Co., at Koppel, Pa. The Henry Shenk Co. has been awarded a contract for the addition to the Hotel Schenley, which will require about 250 tons of steel. A contract has been awarded to the Thompson-Starrett Co. for the Colfax school, Pittsburg, to cost $250,000. The steel will be furnished by an independent mill. We quote the market as follows:

Beams and channels, 15 inches and under, 1.40c; over 15 inches, 1.50c; zees, 1.40c; tees, 1.45c; angles, from 3 to 6 inches, 1.40c; over 6 inches, 1.50c; universal and sheared plates, 6¼ inches wide and wider, 1.40c.

Merchant Pipe.—More activity in the way of inquiries and miscellaneous business is noted in this market at present than for some months and mill operations have been materially increased. An eastern gas interest has placed an order with an independent mill for about 30 miles of 10 and 12-inch steel pipe and a local gas interest has closed for 5,000 tons of iron pipe, the business being divided among several mills. Bids will close Friday of this week on the inquiry of the Tri-County Natural Gas Co. for about 80 miles of from 2-inch to 16-inch steel pipe. Heavy tonnage is involved in other inquiries under active negotiation. We quote the following official discounts in carload lots, subject to the usual preferential discount to the larger buyers, merchant pipe, where specified, being offered in from ⅛ to 6 inches:

Iron and Steel Basing Prices.

	Steel.		Iron.	
	Butt weld.			
	Black.	Galv.	Black.	Galv.
⅛, ¼, ⅜ inch.....	72	58	68	54
½ inch	75	63	71	59
¾ to 1½ inch.....	79	69	75	65
2 to 3 inches.....	80	70	76	66
	Lap weld.			
2 inches	76	66	72	62
2½ to 4 inches.....	78	68	74	64
4½ to 6 inches.....	77	67	73	63
7 to 12 inches.....	75	59	71	55
EXTRA STRONG, PLAIN ENDS.				
	Butt weld.			
⅛, ¼, ⅜ inch	69	59	65	55
½ inch	74	68	70	64
¾ to 1½ inch	78	72	74	68
2 to 3 inches	79	73	75	69
EXTRA STRONG, PLAIN ENDS.				
	Lap weld.			
2 inches	75	69	71	65
2½ to 4 inches.....	77	71	73	67
4½ to 6 inches.....	76	70	72	66
7 to 8 inches.....	69	59	65	55
9 to 12 inches.....	64	54	60	50
DOUBLE EXTRA STRONG, PLAIN ENDS.				
	Butt weld.			
½ inch	64	58	60	54
¾ to 1½ inch	67	61	63	57
2 to 3 inches	69	63	65	59
DOUBLE EXTRA STRONG, PLAIN ENDS.				
	Lap weld.			
2 inches	65	59	61	55
2½ to 4 inches	67	61	63	57
4½ to 6 inches.....	66	60	62	56
7 to 8 inches.....	59	49	55	45

Plugged and reamed pipe is furnished at 2 points higher price, either butt or lap weld.

Boiler Tubes.—Slightly heavier buying of merchant and locomotive boiler tubes is noted and specifications against contracts previously made for locomotive boiler tubes are moderately heavy. We quote the market as follows:

	Steel.	Iron.
1 to 1½ inch	49	43
1¾ to 2¼ inch.....	61	43
2½ inch	63	48
2¾ to 5 inch.....	69	55
6 to 13 inch.....	60	43

2½ inch and smaller, over 18 feet, 10 per cent net extra.

2¾ inch and larger, over 22 feet, 10 per cent net extra.

To destination east of the Mississippi river will be sold at delivered discount for carloads lowered by two points, for lengths 22 feet and under; longer lengths, f. o. b. Pittsburg.

Wire Products.—During the past week several orders for wire and nails have been placed with local mills at the advanced prices, which became effective Jan. 20, altlhough there is not a great deal of new business appearing, most jobbers being covered for their early needs. The advanced prices are being maintained by all sellers and it is intimated in some quarters that another advance will be made in the near future, although little information of this character is available. We quote the market as follows:

Wire nails, jobbers' carload lots, $1.75; retailers' carload lots, $1.80, cut nails, jobbers' carload lots, $1.65 to $1.70; painted barb wire, jobbers' carload lots, $1.75, retailers' carload lots, $1.80, with 30c for galvanizing; plain wire to jobbers in carloads, $1.55, and to dealers, in carloads, $1.60, polished staples, $1.75; galvanized staples, $2.05.

Wire Rods.—Low quotations on wire rods have been withdrawn and some mills are not quoting below $29, Pittsburg. While this market has not been thoroughly tested during the past few days, some mills are known to have refused orders at $28.50, Pittsburg. During the first week in January, sales were made as low as $27, Pittsburg, although most mills were asking $27.50, Pittsburg, at that time. We quote the market at $28.50 to $29, Pittsburg, for both Bessemer and open-hearth rods.

Coke.—Shipments of furnace coke against running contracts since Feb. 1 have been considerably heavier than for the corresponding period in January on account of the blowing in of additional blast furnaces, and prices appear to be somewhat firmer, although there has been no important trading at advanced prices. The H. C. Frick Coke Co. during the past two weeks has fired approximately 3,000 additional ovens, while independents are operating on a slightly better basis. Consumers of furnace and foundry coke are pretty well covered for their requirements and sales are confined to small lots. We quote standard Connellsville furnace coke

for prompt shipment at from $1.45 to $1.50, ovens, and for first half at $1.60, ovens. On high grade Connellsville foundry coke, we quote from $1.95 to $2, ovens, for prompt delivery; for first half, at from $2 to $2.50, ovens. The Connellsville Courier's figures for the week ending Jan 28, show 23,832 active ovens with an output of 291,705 tons, as compared with 22,663 active ovens and a production of 287,475 tons the previous week.

Old Material.—Some large sales of scrap have been made in this market during the past week at prices $1 a ton higher than those established by sales during the latter part of January. The buying movement has caused considerable excitement among dealers, although buying has been confined chiefly to the steel companies. A steel company near Pittsburg which has been inquiring for a large tonnage of heavy melting steel and bundled sheet scrap is understood to have bought upward of 10,000 tons of heavy melting steel and about half that amount of bundled sheet scrap. Another steel company near Pittsburg is understood to have taken 2,000 tons of heavy melting steel at about $14.25, delivered, and another sale of 1,500 tons to an Ohio consumer is reported at the same price. Two or three other large consumers of heavy melting steel are understood to be negotiating for fairly heavy tonnages. A few weeks ago sales of heavy melting scrap were reported as low as $13.25, and recent sales show that prices of heavy melting scrap and bundled sheet scrap have been advanced $1 a ton, while sales of small lots of machine shop turnings and cast borings have been made at an advance of 25 cents a ton. The Pennsylvania Railroad Co. is taking bids of between 15,000 and 18,000 tons of scrap, including upward of 5,000 tons of iron and steel rails, etc. We quote, gross tons, delivered in the Pittsburg district, including Monessen, Sharon, Steubenville, Brackenridge and Follansbee, as follows:

Havy melting scrap	$14.00 to 14.75
Rerolling rails	14.50 to 15.00
Bundled sheet scrap	11.00 to 11.50
Iron axles	24.00 to 24.50
Old iron rails	15.00 to 15.25
No. 1 wrought scrap	13.50 to 14.00
Old car wheels	13.25 to 13.75
Low phosphorus	17.00 to 18.00
Machine shop turnings	9.50 to 10.00
Cast borings	8.75 to 9.00
No. 1 cast scrap	13.75 to 14.00
Malleable	13.00 to 13.50
Stove plate	11.00 to 11.50

Copper exports from New York for the month of January were 29,251 tons, as compared with 26,699 tons for January, 1910, and 19,190 tons for the corresponding period in 1909.

CHICAGO

Mild Improvement in Pig Iron—Inland Steel Co. Will Build New Furnace.

Office of THE IRON TRADE REVIEW, 1328 Monadnock Block, Feb. 7.

The most encouraging development of the past week in the Chicago market was a slight revival of interest in pig iron. This branch of the trade is still very quiet, but conditions are perceptibly better than they were during all of January. There is less disposition on the part of sellers of southern iron to make concessions, and it is doubtful if $11, Birmingham, can be shaded at present in this territory. The steel market continues to improve, a notable feature being increased purchases and new contracts for steel bars, which have been rather quiet. Rail orders taken by western interests last week amounted to 40,000 tons. The scrap market has improved slightly and sales made by the Chicago, Rock Island & Pacific railroad last week brought better figures than has been the case for some time.

Pig Iron.—There is a perceptible improvement in southern iron and less disposition is noticed on the part of sellers to cut prices, while buyers seem to be a little better satisfied with the quotations which they receive. While several sales were made in this territory during January on a basis of $10.75, Birmingham, or less, it is doubtful if $11 can be shaded at present. A Kenosha manufacturer is in the market for 700 tons of southern iron for first quarter delivery. Milwaukee interests are closing for 1,200 tons, including 200 tons of high silicon southern iron. A Chicago pipe maker is negotiating for 5,000 tons of low grade southern iron, one lot running 1.25 per cent and under silicon, and the other 1.75 per cent and under, sulphur in both cases being 0.06 per cent and under. We note a sale of 700 tons of southern iron for first quarter delivery to an Illinois manufacturer at $11, Birmingham. The northern market is quiet and prices are nominal. A report circulated to the effect that the Inland Steel Co. has purchased 30,000 tons of basic for delivery by water from a Buffalo furnace as soon as navigation opens is officially denied. This company has blown in its blast furnace, which supplies all the pig iron necessary under present operating conditions. It will be remembered that the Inland Steel Co. purchased several large blocks of basic last fall when its furnace was blown out. In order to have better control over its supply of pig iron and also to take advantage of the benefits derived from charging hot metal direct into the open-hearth furnaces, the company expects to build an additional blast furnace of 400 tons daily capacity at its Indiana Harbor plant. Southern furnaces are quoting rather freely for second quarter shipment at $11, Birmingham.

We quote the market, for Chicago delivery, as follows:

(Prompt shipment and first quarter.)

Lake Superior charcoal	$17.50
Northern foundry No. 2	15.50
Southern foundry No. 2	15.35
Southern silveries, 5 per cent silicon	16.35
Jackson Co. silveries 8 per cent	19.40
Malleable Bessemer	15.50
Alabama basic	15.35

Billets.—We note an inquiry for 500 tons of open-hearth forging billets. The market is a trifle more active. The Corporation continues to maintain its price of $31, but consumers are able to buy open-hearth forging billets, f. o. b. Chicago, for $28 at present.

Merchant Bars.—Iron bar specifications were fairly heavy last week, but prices have not shown any buoyancy up to the present time. There has been considerable improvement in specifications and new business in steel bars, which have been rather quiet heretofore. A prominent independent interest received specifications covering 4,800 tons of steel bars last week and contracts for new business calling for 1,600 tons. Sales of steel bars out of stock are also improving perceptibly. Agricultural interests have not yet entered the market for their 1911 requirements, but good orders from this quarter are expected during the spring.

We quote, Chicago delivery, as follows:

Bar iron, 1.30c to 1.35c; hard steel bars, re-rolled, 1.35c to 1.40c; soft steel bars and bands and small shapes, 1.58c to 1.63c, base; hoops, 1.68c to 1.73c; planished or smooth finished tire steel, 1.78c to 1.83c, base; iron finished tire steel, 1.73c, base; smooth finished machinery steel, 1 inch and larger, 1.98c; spring steel, 2.28c; crucible spring steel, 2.78c; tool steel, 7c to 9c, with higher prices for special grades. Quotations on shafting are 57 per cent off the list for carload lots, and 52 per cent off for less than carload lots, carload freight allowed to points in base territory.

On iron and steel from local stock, we quote as follows:

Bar iron, 1.80c to 1.90c, per pound base; soft steel bars, 1.80c to 1.90c per pound base; soft steel hoops, 2.10c to 2.20c, full extras.

Structural Material.—The structural market continues to expand and in addition to large jobs the number of small orders is encouraging. Contracts let reported in the Chicago market last week amount to 9,647 tons.

The Northwestern Terra Cotta Co., Chicago, has let a contract for building to the American Bridge Co., amounting to 1,000 tons. The Bon Marche building, Seattle, Wash., 1,443 tons, has been taken by the Vulcan Iron Works, Seattle. The Monroe building, Chicago, 2,714 tons, was let to the South Halsted Street Iron Works, Chicago. The Western Steel Car & Foundry Co., Hegewisch, Ill., has let a building, 1,460 tons, but full details are withheld. The Chicago, Burlington & Quincy Railroad, which has been in the market for bridges, let 2,500 tons last week and it is understood that it was taken by the Pennsylvania Steel Co.

We quote mill prices for structural shapes, f. o. b. Chicago as follows:

Beams and channels, 15 inches and under, 1.58c to 1.63c. For extras, see Pittsburg report.

On structural material from store, we quote, Chicago delivery, as follows:

All angles, 3 inches and larger, including 6 inches, $1.80 to $1.90 per 100 pounds; angles over 6 inches, $1.90 to $2 per 100 pounds, base; beams, 3 to 15 inches, inclusive, $1.80 per 100 pounds, base; channels, 3 inches and larger, $1.80 per 100 pounds, base.

Rails and Track Supplies.—The leading interest booked 40,000 tons of standard rails last week, including its allotment of the Pennsylvania Railroad order. Business in light rails is still satisfactory. There is perceptible improvement in the orders received for track supplies, but up to the present time quotations in this market have not been advanced and railroad spikes are being sold 1.65c f. o. b. Joliet, while quotations on track bolts are 2.15c.

See Pittsburg report for prices on standard sections.

We quote, light rails and track supplies, f. o. b. Chicago, as follows:

Light rails, carloads, 40 to 45-pound, 1.16c to 1.20½c; 30 to 35-pound, 1.19½c to 1.24c; 16, 20 and 25-pound, 1.20½c to 1.25c; 12-pound, 1.25c to 1.29½c.

Light section relayers, 45 pounds and under, subject to inspection, $21 to $23; standard section relaying rails, subject to inspection, $23.50 to $24.

Track supplies, f. o. b. Joliet, angle bars, 1.50c to 1.60c; railroad spikes, 1.65c to 1.75c; smaller size spikes, 1.70c, base; track bolts with square nuts, 2.15c to 2.25c, base.

Plates.—No car business of consequence was let in the west during the past week. Routine plate orders are fairly heavy and specifications show some improvement. Local plate mills are operating on fair schedules.

We quote, f. o. b. Chicago, as follows:

Tank plates, ¼ inch thick, 6¼ to 100 inches wide, 1.58c to 1.63c. For extras, see Pittsburg report.

Store prices are as follows:

Tank steel, ¼ inch and heavier, up to 72 inches wide, 1.80c to 1.90c; from 72 inches to 96 inches wide, 1.90c to 2c; 3-16 inch up to and including 60 inches wide, 1.90c to 2c; 72 inches, 2.15c to 2.25c; No. 8, up to 60 inches wide, 1.95c to 2.05c. Flange quality and heads, 25c extra.

Sheets.—Sales of sheets both by mill interests and out of store are perceptibly better. There has been some disposition on the part of Ohio mills in the past to enter this market with low quotations, but these have generally been withdrawn and prices are now being well maintained by all interests.

We quote, store prices, f. o. b. Chicago, as follows:

Blue annealed No. 10, 2.10c to 2.20c; No. 12, 2.15c to 2.25c. Box annealed, No. 28, 2.75c to 2.85c. Galvanized, No. 28, 3.65c to 3.75c.

For mill prices, see Pittsburg report. Freight to Chicago, 18 cents.

Wire Products.—A recent advance in the price of all wire products amounting to $1 a ton has had a good effect on trade. In practically every instance, jobbers have followed the lead of the manufacturers and advanced their quotations to cover the recent increase in mill prices. Heavy specifications are being received by the leading interest and mill operations are expanding.

We quote, f. o. b. Chicago, as follows:

Wire nails, jobbers' carload lots, $1.93; retailers' carload lots, $1.98; retailers' less than carload lots, $2.08; painted barb wire, jobber's carload lots, $1.93; retailers' carload lots, $1.98; retailers', less than carload lots, $2.08; with 30c for galvanizing; plain wire to jobbers, $1.73; plain wire, retailers' carload lots, $1.78; staples, bright, $1.93.

Merchant Pipe and Tubes.—The large number of high office buildings for which contracts have recently been let in Chicago will have a beneficial effect on the local market for merchant pipe, since comparatively heavy tonnages will be required for these buildings. Building operations in general have been quite active all winter on account of mild weather conditions and this has sustained the demand for the more commonly used sizes of merchant pipe. There is also a better tone in the tube market. The new mill of the Globe Seamless Steel Tubes Co. at Milwaukee will commence manufacturing seamless boiler tubes in the near future and a comfortable tonnage has been booked by the new plant.

We quote, iron and steel pipe and tubes out of store, f. o. b. Chicago, as follows:

Iron and Steel Pipe Basing Price.

	Steel.		Iron.	
	Black.	Galv.	Black.	Galv.
⅛-¾ inch	69.2	54.2	63.2	48.2
⅛ inch	72.2	59.2	66.2	53.2
2. in. to 3 in.	77.2	66.2	72.2	61.2
4½-6 inches	74.2	63.2	69.2	58.2
7-12 inches	71.2	54.2	67.2	50.2
EXTRA STRONG PLAIN ENDS.				
⅛ inch	70.2	63.2	64.2	52.2
2-3 inches	75.2	68.2	61.2	55.2
7-8 inches	65.2	....	59.2	47.2
DOUBLE EXTRA STRONG.				
¼ inch	58.2	50.2	....	....
2-3 inches	63.2	55.2	....	....
7-8 inches	53.2	41.2	....	....

Tubes.

	Lap weld steel. Per cent.	Charcoal iron. Per cent.	Shelby seamless. Per cent.
1 inch	38	..	57½
1¼ to 2¼ inch	52	38	35
2¾ to 5 inch	62	50	46

Cast Iron Pipe.—Gas companies continue to specify freely for their spring requirements. A contract for 2,300 tons of 36-inch and 1,000 tons of 30-inch water pipe was let by the city of Chicago on Feb. 1 to the United States Cast Iron Pipe & Foundry Co. The prices were the same as in the case of a previous purchase by the Chicago water department a few weeks ago, namely $23.75 per ton. Pipe interests hope to advance their quotations in the near future on account of improved general conditions.

We quote, f. o. b. Chicago, as follows:

Four-inch water pipe, $25; 6 to 12 inches, $24.50, larger sizes, $23.75; gas pipe, $1 a ton higher.

Old Material.—The scrap market is showing a little more buoyancy and prices have advanced to some extent. The Rock Island sold 2,400 tons of various grades last week and obtained better figures than has been the case for some time. Iron rails were sold at $14.85 and re-rolling rails at $13.35. One lot of 250 tons of railroad wrought was sold for $11.80 and another lot of 140 tons brought $12.25. Twenty-five tons of iron arch bars and transoms were sold for $14.75 and 120 tons of No. 1 cast scrap for $12.50. Uncut frogs and switch points brought $9.50; 30 tons of steel couplers and knuckles were sold for $11.05 and a like quantity of steel angle bars, splices and fish plates were disposed of at $11.25.

We quote the market, f. o. b. Chicago, as follows:

GROSS TONS.

Old car wheels	$12.00 to 13.00
Old iron rails	14.50 to 15.00
Rerolling rails (5 ft. and over)	13.25 to 13.75
Old steel rails (3 ft. and under)	12.50 to 13.00
Frogs, switches and guards	11.75 to 12.25
Heavy melting steel	11.50 to 12.00
Shoveling steel	11.25 to 11.75

NET TONS.

No. 1 R. R. wrought	$11.75 to 12.25
No. 2 R. R. wrought	10.75 to 11.25
Arch bars and transoms	14.50 to 15.00
Knuckles, couplers and springs	11.50 to 11.75
Shafting	15.75 to 16.25
Iron car axles	18.25 to 18.75
Steel car axles	17.50 to 18.00
Locomotive tires	16.00 to 16.50
Dealers' forge	10.50 to 11.00
Pipes and flues	9.00 to 9.50
No. 1 cast, 150 lbs. and less	12.25 to 12.75
No. 1 busheling	9.50 to 10.00
No. 2 busheling	8.50 to 9.00

No. 1 boiler cut	8.75 to 9.25
Boiler punchings	14.25 to 14.75
Cast and mixed borings	6.00 to 6.50
Machine shop turnings	7.00 to 7.50
Railroad malleable	10.75 to 11.25
Agricultural malleable	10.25 to 10.75
Stove plate and light cast scrap	10.25 to 10.75
Angle bars, splices, etc., iron	13.00 to 13.50
Angle bars, steel	11.25 to 11.75

CLEVELAND

Heavy Inquiry for Basic Pig Iron and Market is Firmer.

Office of THE IRON TRADE REVIEW,
Penton Building, Feb. 7.

Iron Ore.—In spite of the sales of some 150,000 tons of Wabana ore in the east, there is no interest in the Lake Superior market, and nothing more definite in regard to prices can be said than could have been said many weeks ago.

On base ores with the guarantee of 55 per cent on old range and Mesabi Bessemer, and 51½ per cent on old range and Mesabi non-Bessemer, we quote as follows: Old range Bessemer, $5; Mesabi Bessemer, $4.75; old range non-Bessemer, $4.20; Mesabi non-Bessemer, $4.

Pig Iron. — Negotiations for large amounts of basic, amounting to from 50,000 to 60,000 tons, have been a feature of the past week. These negotiations have been terminated for the present at least, but have left the market in a stronger condition. Prominent buyers were willing to pay $13.50, valley, but could not get the tonnage desired at that figure, and several important interests are now holding at $14. In spite of this quotation, it is true that two sales amounting to 6,000 tons were made within a few days at $13.25, valley, but the seller states that these sales were made under special conditions, and that nothing will now be sold below $14. With the exception of about 75,000 tons, held by a company near Pittsburg, basic stocks are held by interests which are acting harmoniously in favor of higher quotations. The attitude of the owners of the large tonnage referred to is not known. A Cleveland seller has this week refused an offer of 10,000 tons for delivery in February, March, April and May, and 4,000 tons in 60 days, the price in both cases being $13.50. We note the sale of 1,000 tons of No. 2 foundry at $14, at the furnace, for shipment outside of the city. We quote, delivered in Cleveland for the first half of this year, as follows:

No. 1 foundry	$14.75
No. 2 foundry	14.25
No. 2 Southern	15.35
Gray forge	14.00
Bessemer	15.90
Lake Superior charcoal	17.50
Jackson Co. 8 per cent silvery	19.00

Coke.—The market continues quiet, with no transactions of importance taking place.

Connellsville furnace coke, $1.40 to $1.45 for prompt delivery, and $1.60 for first half. Connellsville foundry coke, $1.95 to $2 for prompt, and $2 to $2.50 for first half.

Finished Material.—The placing of orders for new boats has been responsible for the largest orders placed in some time for structural material. In addition to the 3,000 tons of shapes and plates for the new ore boat to be built for the Wisconsin Steel Co., referred to last week as awarded to the Jones & Laughlin Steel Co., the Cambria Steel Co. will furnish 8,500 to 9,000 tons of shapes and plates for two large ore boats for W. P. Snyder and the Carnegie Steel Co. has received a contract for 2,500 tons for a new Detroit & Cleveland Navigation Co. passenger boat. A very encouraging feature of the past few days has been the indication of increased activity of railroads. It is expected that announcement will soon be made of the purchase of some fair sized tonnages of steel rails and other products. Bar iron shows improvement, and Cleveland mills now have no difficulty in keeping in operation. Bar iron prices are less ragged. Sheets are firm.

Old Material.—A little better feeling is manifested in the local market, which is extending into surrounding territory. Mills are showing more disposition to buy and there is some demand for heavy steel as well as turnings. This has resulted in a slight rise in the prices of turnings and borings, but while the price of heavy steel has a hardening tendency yet the price is unchanged today. We quote, gross tons, f. o. b. Cleveland, as follows:

Old iron rails	$15.00 to 15.50
Old steel rails (under 6 ft.)	13.50 to 14.00
Old car wheels	12.00 to 12.50
Old steel boiler plate	10.00 to 10.50
Malleable iron (railroad)	12.75 to 13.25
Steel axles	18.00 to 18.50
Malleable iron (agricultural)	11.00 to 11.50
Heavy steel	12.75 to 13.00
Country mixed steel	10.00 to 10.50

We quote, net tons, as follows:

No. 1 R. R. wrought	$12.00 to 12.50
No. 1 busheling	10.50 to 11.00
No. 1 machine cast	11.75 to 12.25
Axle turnings	8.50 to 9.00
Machine shop turnings	6.50 to 7.00
Grate bars	10.00 to 10.50
Pipes and flues	8.50 to 9.00
Tank iron	8.00 to 8.50
Sheet iron	4.00 to 4.50
Wrought drillings	6.50 to 7.00
Cast borings	6.00 to 6.50
Stove plate	10.00 to 10.50

The Inland Steel Co., Chicago, has declared an extra dividend of 3 per cent, payable March 1, to stockholders of record at the close of business, Feb. 10. The regular quarterly dividend of 1¾ per cent has also been declared.

CINCINNATI

Little More Demand for Pig Iron of Various Grades.

Office of THE IRON TRADE REVIEW,
808 Provident Bank Bldg., Feb. 7.

Pig Iron.—Southern iron at this time is a shade firmer than northern iron, particularly in the lower grades, Nos. 3 and 4 and gray forge. All the iron of these grades that has been made has practically been disposed of, and any that is made from time to time finds a ready market. Numerous sales for from one car to 400 or 500 tons continue, in the aggregate making a fair tonnage. Some analysis iron and high silicon iron has been bought by an Indiana interest amounting to between 3,000 and 4,000 tons, with delivery extending over a part of the last half. With the pipe interests buying rather extensively, and one or two fair-sized inquiries out, the situation is considered somewhat improved. Base quotations are $11, Birmingham, and $14, Ironton, for southern and northern No. 2. There is little inquiry for malleable and $14, Ironton, is the quotation. Buyers and sellers alike feel that production has now reached a state where it is somewhat below demand, and as soon as the stocks in furnace yards have been cleaned up, there may be some change in prices. Foundry interests generally are stocked and have contracted for a supply to last them through the first half. Buyers are willing to contract for the last half at present quotations, but furnaces refuse to make quotations further than first half at this time. Specifications against contracts continue good and the small sales are numerous. Based on a freight rate of $3.25 from Birmingham and $1.20 from Ironton, we quote, f. o. b. Cincinnati, for prompt shipment, as follows:

Southern foundry No. 2	14.25	14.75
Southern foundry No. 3	13.75	14.25
Southern foundry No. 4	13.25	13.50
Southern gray forge	13.00	13.25
Mottled	12.75	13.00
Southern No. 1 soft	14.75	15.25
Southern No. 2 soft	14.25	14.75
Standard Southern car wheel	25.25	25.75
Northern No. 2 foundry	15.20	15.45
Northern No. 3 foundry	14.70	14.95
Northern No. 4 foundry	14.20	14.45

Coke.—Coke continues inactive, but stronger than last week, due to a little foundry buying. Sales are for immediate shipment and for small lots only to fill in contracts where melters are exceeding estimated consumption and where new business has developed since placing contract orders. Connellsville furnace coke has slightly advanced and is now held at $1.60 to

$1.70 for prompt shipment. The following quotations are for prompt shipment and for first half:

	Prompt Shipment.	Contract to July 1.
Connellsville district:		
Foundry coke	$2.00 to 2.25	$2.25 to 2.50
Furnace coke	1.60 to 1.70	1.65 to 1.75
Wise county district:		
Foundry coke	2.00 to 2.10	2.00 to 2.10
Furnace coke	1.75	*Sliding [scale basis.
Pocahontas district:		
Foundry coke	2.00 to 2.10	2.10 to 2.25
Furnace coke	1.75	1.75 to 1.85
New river:		
Foundry coke	2.50 to 3.25	2.60 to 3.25
Furnace coke	2.00 to 2.15	2.10 to 2.20

*Sliding scale basis means $1.60 for coke based on $9, Birmingham, for pig iron, with an advance of 16 2-3 per cent of the amount over $9 at which pig iron is quoted. This is the usual basis. Other forms of sliding contracts are also made.

Finished Material.—Finished material continues active, and it is generally admitted that a decided increase in business will appear in the near future. Jobbers' stocks are running very low and many are very low on standard sizes. Some railroad buying is expected shortly. A weakness in iron bars is apparent locally, iron bars being obtainable locally at 1.35c to 1.40c at present. Steel is holding firm at 1.40c, Pittsburg base. A number of new buildings are being planned by local architects, among which are the Cahill Shoe Co., whose plant was recently destroyed by fire.

Old Materials.—In common with the iron market conditions and prices are unchanged. Buying is in excess of sales, most dealers accumulating stocks steadily. There is some activity in old car wheels and a little less activity in old re-rolling steel. Prices quoted below are those paid by dealers when buying, an additional charge being added for dealers' profit, cost of separation and handling when sold. The following prices about represent the market:

GROSS TONS.

Old iron rails, gross	$14.50 to 15.00
Old steel rerolling, gross	13.00 to 13.50
Old iron axles, gross	17.75 to 18.25
Steel melting scrap, gross	11.00 to 11.75
Car wheels, gross	11.00 to 11.50

NET TONS.

Old No. 1 R. R. wrought, net tons	$10.50 to 11.00
No. 1 machinery, net	10.50 to 11.00
No. 1 busheling, net	10.00 to 10.50
Stove plate, net	8.00 to 8.50
Heavy turnings, net	6.50 to 7.00
Cast borings, net	4.50 to 5.00
Grate bars	8.00 to 9.00
Sheet scrap, net	8.50 to 9.00
No. 1 cast scrap	10.50 to 12.00

M. Curry has been elected president of the Canadian Steel Foundries, Ltd., recently organized to take over the Montreal Steel Works, Ltd., and the Ontario Steel Co. The other officers and directors are as follows: W. W. Butler, W. F. Angus, K. W. Blackwell, vice presidents; W. A. Skelton, secretary; James R. Wilson, A. H. Chave and W. W. Near.

PHILADELPHIA

Iron Inquiries Are Freer—Basic Pending—Better Finished Tone.

Feb. 6.

Pig Iron.—In point of numbers, buyers continue to show a greater appreciation of the favorable price opportunities of the market. The tonnage actually inquired for, however, while considerable, is not correspondingly large for a good part of the pending business represents the requirements of small foundry consumers. A very fair proportion of these prospects is materializing into orders at about the quoted prices. On the tonnage grades, for this market, especially steel making irons, makers and buyers are apart in their views of prices and developments are awaited before signing contracts. In basic, there is a round tonnage in sight which would probably be placed at an offer favorable to the consumer. One eastern steel works alone is credited by reports with being desirous of closing for 15,000 to 20,000 tons for first and second quarters and has been tendering around $14.25 delivered but makers generally are asking a minimum of $14.50 delivered and are not willing to apply this price to extended forward shipments. Some are holding at $15 delivered for second quarter. The basic market continues quotable at $14.50, delivered in the east, at which level a lot of 4,000 tons for early delivery was sold the latter part of last week. A steel company which recently contracted for a block of this grade is negotiating for 5,000 tons of low phosphorus for first half. This grade has sold in this territory of late around $21, delivered, representing the quotations of nearby furnaces. Eastern Pennsylvania foundry irons are quite firm at from $15 for 2 plain to $15.50 for 2X delivered in Philadelphia and vicinity. On distant shipments these prices are sometimes sharply cut to meet competition. Though most Virginia sellers are asking $13 furnace for No. 2X, reports of $12.75 and even lower come from that territory. A sale of 1,000 tons of Virginia iron running 3 per cent and over in silicon for first half shipment to a Richmond consumer is noted. Virginia basic is quoted at $13, furnace. Standard forge is about $14 eastern Pennsylvania furnace with only small lots being sold. Pipe iron, northern and southern, is selling at about $14.25 delivered in this district. The pipe makers continue to take on lots regularly but such sales this week have not been large. At a meeting of the Virginia Pig Iron Association in this city, the past week, a reduction in furnace stocks in that territory was reported. Seven Virginia furnaces are now blowing.

We quote for prompt and first quarter shipment to Philadelphia and vicinity as follows:

No. 1X foundry	$16.00 to 16.25
No. 2X foundry	15.50 to 15.75
No. 2 plain	15.00 to 15.50
Standard gray forge	14.25 to 14.50
Basic	14.50
No. 2X Virginia	15.65 to 15.80
No. 2 Southern	15.00 to 15.50
Standard low phosphorus	21.00 to 21.50

Finished Material.—Substantial increase in tonnage freshly booked or released for rolling is shown in several instances but the most striking improvement of the market is largely sentimental in character. The present spirit of makers is to more confidently expect a gradual but sustained expansion of tonnage. The week's advance of $2 a ton in tin plate, though based upon the special condition of an advanced pig tin market, has had a measure of influence in suppressing talk of probable price reductions.

As already noted, the orders for rails and track supplies have considerably increased. In supplies, particularly frog and switch work, January business with prominent manufacturers for the first month in six months, exceeded shipments. A fair amount of rail tonnage for eastern roads is still pending, though these lines have been liberal buyers. Eastern plate mills have been enjoying some increase in business taken but shape tonnage does not show much change. The Pennsylvania railroad will build 1,000 gondola freight cars in its Altoona shops, which will require about 10,000 tons of shapes and plates. The American Car & Foundry Co. is ordering material for cars recently taken for the New York, Ontario & Western which are being built at the Berwick, Pa., plant. Billet consumers have been more liberal with releases of tonnage on old contracts and a fair new business is being booked including some forging billets at the recently increased differential over rolling billets, which makes the present price $30.40 Philadelphia. The steel for the Vine street piers, 3,000 tons, for which the general contract has gone, as reported, to W. S. P. Shields, will be furnished by the Pennsylvania Steel Co. No award of the 4,000 tons for the department of printing and engraving

building at Washington, has yet been made.

We quote for delivery in Philadelphia and vicinity as follows:

Structural shapes, 1.55c to 1.60c; steel plates, 1.55c; steel bars, 1.55c to 1.60c; refined bar iron, 1.30c to 1.35c; 4 x 4-inch open-hearth rolling billets, $25.40; forging billets, $30.40.

Old Material.—A better tone is to be noted in the old material market and while consumers, generally, have not resumed anything like liberal buying, there is a stronger note to prices in some grades. After some export sales of car wheels, domestic consumers have shown an awakened interest in this material and prices are higher, reaching about $13.50 delivered. This export movement in car wheels and old iron rails, as well, has gone to Canada, Italy, Belgium and Germany but has not been large, amounting to probably 2,000 to 3,000 tons. Turnings and borings have sold at higher prices. Heavy steel is about stationary but no large tonnages could probably be negotiated at ruling levels. There is some speculation by dealers in railroad wrought, upon which prices are firm. We quote gross tons delivered in Eastern Pennsylvania consuming territory as follows:

Old steel rails (re-rolling)	$15.00 to 15.50
Heavy melting steel	$12.75 to 13.25
Old car wheels	13.50 to 14.00
Old iron car axles	25.00 to 26.00
Old steel car axles	20.00 to 21.00
No. 1 railroad wrought	16.00 to 16.50
Wrought pipe	13.00 to 13.50
Cast borings	8.25 to 8.75
Wrought turnings	8.75 to 9.00
Heavy cast scrap	14.00 to 14.50
Railroad malleable	12.00 to 12.50
Stove plate	10.50 to 11.00

ST. LOUIS

Some Pig Iron Sold, But Inquiry Aggregate is Small.

Feb. 6.

Pig Iron.—The market, which has been virtually stagnant in the St. Louis territory for the last several weeks, took an upturn Friday and Saturday, resulting in sales to a large steel plant of 3,000 tons of basic, 3,000 tons of southern foundry and 5,000 tons of malleable Bessemer, and 300 tons of gray forge to another plant. Some of the iron sold to the steel plant will go to Chicago, and the remainder to St. Louis. Although the inquiry now in the market does not approach much of a tonnage and is made up of small lots, local salesmen are confident that conditions are better than they have been for quite a while. This belief is expressed, too, in the face of the fact that the plants of the American Steel Foundries, at Granite City and East St. Louis, Ill., have closed down for two weeks. The company states that the shutdown is only temporary, and is partly due to a desire to make repairs and partly to the fact that orders from railroads for immediate work have slumped considerably. The plants have orders, but delivery is not expected before the first or middle of March. Southern No. 2 iron is still quoted at $11 to $11.50, Birmingham, but there is a general understanding that the $11 price could be shaded slightly. Northern iron, and malleable Bessemer are offered at $14 to $14.50, Ironton, O., with very little inquiry. Quotations on southern iron, delivered, to which the Birmingham freight of $3.75 has been added, follow:

Southern No. 1	$15.25 to 15.75
Southern No. 2	14.75 to 15.25
Southern No. 3	14.25 to 14.75
Southern No. 4	13.75 to 14.25

Coke.—The demand seems to be growing, and the general tone of the market is somewhat better. A sale of 15 cars of foundry coke was made Saturday. Some ovens manifest an inclination to advance prices on better grades, but as a general thing prices remain as follows:

We quote 72-hour Connellsville foundry grades, $2.35 to $2.50 for whole of 1911; 72-hour foundry, $2 to $2.25, on tracks and for immediate delivery; 48-hour Connellsville furnace, $1.60 to $1.85; best 72-hour Virginia foundry, $2 to $2.35; 48-hour Virginia furnace, $1.60 to $1.85. The freight to East St. Louis and St. Louis is $2.80, and $2.70 from the Virginia fields when shipment is destined beyond St. Louis.

Old Material.—The demand for scrap iron is about as it has been for a long time, with prices remaining nominally as follows:

Old car wheels	$13.50 to 14.00
Old iron rails	14.50 to 15.00
Rerolling rails (4 ft. and over)	13.00 to 13.50
Old steel rails (2 ft. and under)	12.00 to 12.50
Light section relayers, 45 lbs. and under, subject to inspection	21.00 to 23.00
Relaying rails, subject to inspection	24.50 to 25.00
Frogs, switches and guards	12.00 to 12.50
Heavy melting steel	12.00 to 12.50
Shoveling steel	12.00 to 12.50

We quote, net tons, as follows:

No. 1 R. R. wrought	$11.50 to 12.00
No. 2 R. R. wrought	10.50 to 11.00
Arch bars and transoms	14.00 to 14.50
Knuckles, couplers and sprihgs	12.00 to 12.50
Shafting	15.00 to 15.50
Iron car axles	18.50 to 19.50
Steel car axles	18.50 to 19.50
Locomotive tires	14.50 to 15.00
No. 1 country wrought	9.50 to 10.00
Pipes and flues	9.00 to 9.50
No. 1 cast, 510 lbs. and less	12.00 to 12.50
No. 1 busheling	10.25 to 10.75
No. 2 busheling	7.00 to 7.50
No. 1 boiler cut	9.00 to 9.50
Boiler punchings	10.25 to 10.75
Cast and mixed borings	5.00 to 5.50
Machine shop turnings	7.00 to 7.50
Railroad malleable	10.00 to 10.50
Agricultural malleable	9.00 to 9.50
Stove plate and light cast scrap	9.50 to 10.00
Angle splice bars, iron	13.25 to 13.75
Angle splice bars, steel	12.00 to 12.50

BUFFALO

Pig Iron Sales at Low Prices—Better Feeling in Finished Lines.

Buffalo, Feb. 7.

Pig Iron.—Although a good-sized tonnage has been placed in the last week, business on the whole shows only a slight improvement as far as the pig iron market is concerned. Owing principally to the fact that close to 15,000 tons of foundry iron has been booked in the last ten days the volume of business under negotiation shows a decided decrease, as new inquiries have been coming in very slowly and fall far short of the amount of iron contracted for. The tonnage under negotiation is, however, fairly large. Prices are about 50 cents lower on most grades. Foundry iron has been sold as low as $13.50, but most of the tonnage booked recently went at a somewhat higher figure and the low price mentioned cannot be said to be general.

We quote f. o. b. furnace, as follows:

No. 1X	$14.00 to 14.50
No. 2X	13.50 to 14.25
No. 2 plain	13.50 to 14.00
No. 3	13.50 to 14.00
Gray forge	13.50 to 14.00
Malleable	14.00
Basic	14.50
Charcoal	17.25

Finished Products.—The agencies report that a better feeling is noted among the buyers. For some time past they have been holding off waiting to see if reductions would be made, now they are seeking information as to the possibility of advances. Little change is noticeable as far as general lines are concerned. There are a number of inquiries in the market for bars and structural material, contracts covering first half. There has been an advance of 10 cents per base box on tin plate and the feeling seems to be general that if the price of sheet bars is advanced and pig tin remains where it is or goes higher, another advance of 10 or 15 cents is possible in the near future. The prospects for spring building are very good, but there are few sizable jobs being figured at present.

Old Material.—Shipments are moving better and on the whole the market is somewhat improved though large contracts are not reported. There has been a considerable increase in inquiry. There is some local consumption and a good deal of scrap iron has been shipped out of the dis-

trict. We quote gross tons, f. o. b. Buffalo, as follows:

Heavy melting steel	$12.75 to 13.00
No. 1 railroad wrought scrap	14.75 to 15.25
No. 1 railroad and machine cast scrap	14.00 to 14.50
Old steel axles	18.50 to 19.00
Iron axles	23.00 to 24.00
Car wheels	13.75 to 14.25
Railroad malleable scrap	13.75 to 14.00
Machine shop turnings	7.00 to 7.25
Cast iron borings	6.50 to 6.75
Low phosphorus steel scrap	17.00 to 17.50
Old iron rails	16.75 to 17.25
Tank iron	10.75 to 11.25
Sheet iron	6.50 to 7.00
Pipes and flues	10.75 to 11.25
Stove plate	12.00 to 12.50
Grate bars	11.50 to 12.00
Boiler plate	11.50 to 12.00

BIRMINGHAM

Eleven Dollar Price Not Acceptable to All Sellers Through First Half.

Feb. 7.

Pig Iron.—Notwithstanding the reports to the contrary, it is not believed that the schedule of $11 per ton, Birmingham, has been shaded for any deliveries. It is noted that such figures are not acceptable to all producing interests for shipments to cover the remainder of the first half, but without a higher price having been received, we quote those figures either for nearby deliveries or shipments extending through June of this year. As to whether or not the $11 schedule could be made to apply to shipments through the third quarter, a definite statement is not warranted owing to the lack of a record of such transactions. A very attractive tonnage for shipment extending into the second half was recently offered, but it is understood that no figures were elicited other than on shipments prior to July 1. The recent movement from furnace yards has no doubt been at a rate in excess of the output and it is now believed that a material reduction in the aggregate of stock accumulations was effected during the month of January.

Cast Iron Pipe.—A very satisfactory tonnage was recently booked by the manufacturers of this material and it is understood that the average price received is considerably more satisfactory than shown by records for some weeks past. With the sale of certain municipal bonds one or more contracts for round tonnages of water pipe are expected to come up for letting, but the tonnage actually in sight at this time consists of one lot of 3,000 tons and another of 1,500 tons. There is, of course, in addition to the tonnages just mentioned, the small orders that are placed from time to time for maintenance and extensions. The entire producing capacity is not in operation at this time, but the suspensions are understood to result from necessary repairs rather than an over-production. Quotations on water pipe have recently been advanced and we are authorized to quote as follows per net ton, f. o. b. cars here, viz.: 4-inch to 6-inch, $20; 8-inch to 12-inch, $19; over 12-inch, average $18 per ton, with $1 per ton extra for gas pipe.

SEATTLE

Charter Rates Drop and Considerable Iron is Afloat.

Feb. 2.

Pig Iron.—The charter rates on vessels engaged in the trade between the Pacific coast and the United Kingdom took their usual spring drop yesterday, and from now on an increase in the importation of foreign pig iron may be expected. The lumber mills are also increasing their running time and this has a most brightening effect upon the foundries which rely upon them in the main for their trade. At the same time there is a better freight movement and the delivery of foundry products is not so much of a problem as it has been for some time. About 2,000 tons of pig iron are afloat, consigned to Puget sound firms.

We quote spot iron in gross tons foreign ex-ship Puget sound or Columbia river domestic, f. o. b. Pacific coast terminal, as follows:

	Prompt.	Second quarter.
No. 1 Glengarnock	$24.50	$24.50
No. 1 Eglinton	23.50	24.00
No. 1 English Jarrow	23.50	23.50
No. 1 Chinese Hanyang	23.50	23.00
No. 1 Cleveland	23.50	23.50
English Doncaster	23.00	23.00

Finished Material.—An increased demand for merchant bars on the South Pacific coast has had its effect in bringing several substantial orders to the local market. The Western Steel Corporation received during the week orders for immediate delivery aggregating 500 tons from Los Angeles and San Francisco dealers and also received the second order from Spokane jobbers, who have placed a contract for a large amount of material during the next few months. The demand for sheets continues good. The Princeton Trust Co., E. A. Lundburg, attorney, Chamber of Commerce bldg., Portland, Ore., has commissioned an architect to prepare plans for a 12-story steel and concrete office building to be erected at the northwest corner of Morrison and Park streets, Portland, Ore. The new structure will cost over $250,000.

NEW YORK

More Wabana Ore Sold—Quiet Negotiations for Pig Iron.

Office of THE IRON TRADE REVIEW,
1115 West Street Bldg., Feb. 7.

Iron Ore.—Additional sales of about 50,000 tons of Wabana, Newfoundland, ore have been made to eastern blast furnaces at 7⅛ cents per unit of iron, f. o. b. cars at Philadelphia, which is the same price obtained for this ore on previous sales for this year. Leading foreign sellers of ore are not showing much interest to sell at this time, because of active trade conditions abroad and are apparently waiting for the markets on domestic ores to more clearly establish themselves. The presence in this country of a representative of one of the leading Spanish ore firms is expected to be followed by announcement of sales of Spanish ore.

Pig Iron.—New written inquiry is not coming out so freely, but some consumers are apparently more interested in getting their forward requirements under cover at present prices. Some quiet negotiations to this end have been carried on and sales of about 5,000 tons of this character have just been closed. Shrewd buyers have apparently given heed to the reports of some improvement in finished lines, and are more carefully watching the pig iron market. Some sharp competition for business has developed in New England among Buffalo, up-state and eastern Pennsylvania makers and low prices have resulted. Sales of No. 2X have been made at $15.75, delivered, in New England, which would be equivalent to $13.30, Buffalo, and less than $14, eastern Pennsylvania furnace, and buyers report their ability to obtain iron down to $15.50, delivered. Not all Buffalo makers will do the low prices reported, and some of the aggressive selling has been done by eastern Pennsylvania furnaces and by up-state interests, which of late have not been active factors in the New England foundry market. Some fair-sized sales have been brought out in New England by the sharp competition, including one reported lot of 4,000 tons, but other large consumers are still receptive in their attitude. The General Electric Co. recently closed for 4,000 to 5,000 tons for its Lynn and Pittsfield, Mass., plants. In the metropolitan district, the open inquiry is made up of small lots. One New Jersey consumer is out for 1,000 tons of different foundry grades for first half. Two eastern steel works continue to

informally negotiate for a large tonnage of basic iron in which they seek to duplicate low prices recently made in the east on this grade. Sales, however, are holding firm for a minimum of $14.50, delivered. The recent purchases of one of these interests have amounted to about 15,000 tons. We quote, for prompt and first quarter shipment, as follows:

Northern foundry No. 1	$15.75 to 16.00
No. 2X foundry	15.25 to 15.75
No. 2 plain	14.75 to 15.25
No. 2 Virginia	15.30 to 15.80
No. 2 Southern foundry	15.25 to 15.75
Malleable	15.75 to 16.25
Gray forge	14.25 to 14.50

Rails and Track Material.—Rail contracts just placed by the Boston & Maine and New York and New Haven & Hartford railroads amount to about 70,000 tons. The Boston & Maine purchase was about 50,000 tons, including 7,500 tons for the Maine Central and for the New Haven about 17,500 tons. The Pennsylvania Steel Co. will roll slightly more than half of this tonnage, while the remainder has gone to the Bethlehem Steel Co. and Lackawanna Steel Co.. The Delaware, Lackawanna & Western is also reported to have closed for 23,000, which it is understood will be divided into 10,000 tons each to the Bethlehem and Lackawanna, and 3,000 tons to the Pennsylvania Steel Co. The Bangor & Aroostook Railroad is negotiating for 13,500 tons, which will be rolled by the Pennsylvania Steel Co. The recent order of the Central Railroad of New Jersey placed with eastern mills, calls for 8,000 tons. The Interborough Rapid Transit Co. is in the market for 5,000 tons for maintenance. In track supplies, the market continues to show considerable improvement. More girder rail business is in sight.

Cast Iron Pipe.—Some fair lots of pipe for export are before the market. Havana, Cuba, has taken bids on work requiring 1,300 tons, and another Cuban city has awarded a contract for construction, which requires 2,000 tons, but the pipe is yet to be placed. The market continues to show some improvement. We quote 6-inch pipe at from $21 to $21.50 f. o. b. New York, in carload lots.

Finished Material.—The better tonnage of new business coming to the mills is being reflected by the increase being made to active capacity of steel works, blast furnaces and finishing capacity. Steel makers generally are encouraged by the greater tonnage entered, which is now being well sustained, but there is a disposition to act conservatively until it is more assured that the present improvement is permanent. The hope is expressed that, for the best interest of the trade, the expansion of business will continue to come in a gradual and orderly manner.

Makers of wire rods are now holding uniformly to a basis of $29, Pittsburg, which represents the full $1 advance made in this material when wire products were put up several weeks ago. While sales under this price have recently been made, these have dealt with matters pending at the time of the advance and these having been disposed of, the market has now strengthened to $29.

While there is a considerable tonnage of structural steel pending, especially in New York and eastern markets, which will come out soon, contracts of the week have not been many. Shape mills report a better tonnage, but fabricators' shops in the east are not filled with work, so that sharp competition and low prices continue to appear in different markets. This condition is likely to prevail for some time.

Among the New York inquiries pending upon which no action has yet been taken, are 18,000 tons for the Woolworth skyscraper; 5,000 tons for the Cruishank warehouse; 1,000 tons for the Fischell building; 500 tons for a loft on West Thirty-third street; and other work. The Delaware, Lackawanna & Western Railroad is taking figures on 4,000 tons of steel for its new car shops at Watervliet, N. Y., and the Delaware, Ontario & Western is also out with an inquiry for considerable tonnage for car shops at Middletown, N. Y. Bids have again been taken on 3,000 tons for the new state prison near Dover, N. Y. The Noelke-Richards Co. has taken 200 tons for a power house at Ocoee, Tenn., for which the J. G. White Co. has the contract. The New York Central Lines have recently placed 600 tons with the McClintic-Marshall Construction Co. for terminal work in this city and has other tonnage pending.

We quote, New York delivery, as follows: Angles, 3 to 6 inches x ¼ inch and heavier, 1.56c to 1.61c; beams, 3 to 15 inches, 1.56c to 1.61c; tees, 3 x ¼ inch and heavier, 1.56c to 1.61c; plates, carload, tank, 1.56c to 1.61c; boiler steel, 1.66c to 1.71c; marine boiler, 1.96c to 2.01c; bar iron, 1.34c to 1.37c; soft steel bars, 1.56c to 1.61c.

Old Material.—Conditions in the old material market are about stationary, with small lots still representing the method of buying being done by consumers. Prices are practically unchanged, though in some cases they reflect a slightly better tone, based upon the more promising reports as to mill bookings in finished lines. While some talk of possible exporting of scrap is still current and some offers for steel are being made for southern Europe, particularly Italy, the margins of profit are so close in view of the uncertainties of this traffic, that little development is expected in this line.

We quote gross tons, prices New York dealers will pay at tidewater, with the exception of cast scrap, which has a local demand, as follows:

Old car wheels	$12.00 to 12.50
Old iron axles	22.50 to 23.00
Old steel shafting	16.00 to 16.50
Heavy melting steel	10.50 to 10.75
No. 1 R. R. wrought	12.50 to 13.00
Iron track scrap	11.50 to 12.00
Wrought pipe	10.00 to 10.50
Cast borings	6.00 to 6.50
Wrought turnings	6.00 to 6.50
Heavy cast scrap	12.00 to 12.50
Railroad, malleable	12.00 to 12.50
Stove plate	9.00 to 9.50
Grate bars	9.00 to 9.50

British Iron Market.

Weakness of Cleveland Pig Iron—Finished Department Busy.

Office of THE IRON TRADE REVIEW, Prince's Chambers, Corporation St., Birmingham, Eng., Jan. 28.

Although generally healthy, the market for pig iron includes one disquieting feature, and that is the weakness of Cleveland pig iron. This is a little disconcerting for buyers who rushed into the market at the beginning of January. There has been a series of slight falls during the past few days, so that the selling price yesterday was 49s 3d ($12.06) for No. 3 warrants, with 50 ($12.24) three months, and 49s 6d ($12.12) one month. The explanation given is a continual rise in stocks, which have been added to this month by 17,476 tons, and now approximate 550,000 tons. The effect is to slightly depress the Manchester market, which is always sensitive to such influences, especially as Cleveland iron generally finds its way into Manchester, when prices are low.

METAL MARKETS

St. Louis.

Feb. 6.

Lead and Zinc.—Zinc blende brought a top price in the Missouri-Kansas-Oklahoma district last week of $44 a ton on an assay of $41 in the open market, ranging down to $36 a ton. The top price paid was $45 for choice lots. Calamine brought a top price of $27, with 40 per cent grades selling for $20 to $23 a ton. Lead ore was weaker at $56.50 a ton.

New York.

Feb. 7.

Tin.—The closing cable from London today quoted spot tin at £185 5s,

and three months at £185. These prices represent a decline in value of £18 10s since Jan. 30, which is the severest reaction that the pig tin market has undergone since the syndicate operations have dominated. Presumably liquidation of speculative holdings is responsible for the rapid decline, but there is no definite information to be had as to whom the selling was done for. There is a strong, and perfectly natural disposition among the trade, however, to credit it to the syndicate, and a good many keen judges believe the decline presages even lower prices. The local market has kept pace with the foreign drop in values, and a fair volume of sales has been recorded during the week. The majority of these were done for trading accounts, however. Consumers displayed a wholesome fear of the tin situation, and bought only to meet urgent demands. The metal can be bought at 40.87½c today. London closing prices were the lowest of the session. Spot closed at £185 5s, and three months at £185.

The tin arrivals since Feb. 1 aggregate 1,305 tons and there are 1,445 tons afloat.

Copper.—The copper metal trade is looking for another unfavorable statement by the Copper Producers' Association tomorrow, and interest to buy has been noticeable. Estimates of a balance in favor of production, amounting to from 8,000,000 to 10,000,000 pounds are freely made. If the report confirms the trade's opinion, by showing a large addition to surplus stocks, next week will probably see a further reduction in price by some important sellers. Business has been very quiet since Feb. 1, but the improvement in prices of copper warrants on the London exchange gave this market a little better tone. At the end of last week 12.50c, delivered 30 days, was generally asked for electrolytic, but as the foreign quotation today again turned downward, and there is little domestic demand, that figure could probably be shaded. Lake copper continues to be quoted at 12.62½c to 12.75c, and only occasional sales are noted.

Copper exports since Feb. 1 are 5,929 tons.

Lead.—It was reported yesterday that the leading interest had reduced its selling price of lead. The rumor could not be confirmed, however, and 4.50c, in New York, continues the market.

Spelter.—Some talk is heard of another advance in the price of spelter, by the same interests that put the market up in November and December. After the recent experience with advice which came from that source, there are not many who are anxious to buy spelter on the strength of it, however. The metal can be bought at 5.45c, in New York.

Antimony.—The antimony market is unchanged. Cookson's is 8.25c; Hallett's is 7.75c, and Hungarian is 7.12½c to 7.25c.

Chicago.

Feb. 7.

New Metals.—The new metal market is showing considerable life, although the tendency of copper during most of last week was toward lower prices. Recently, however, on account of improved demand, copper quotations have stiffened to some extent and the net result of the week's operations is that prices have not changed in the Chicago market. Spelter was quiet early in the week, but is now more active and prices have advanced to 5.40c, Chicago. During the middle of last week, quotations were as low as 5.30c, but no business was taken at this figure. Tin is a little weaker, current quotations being 42c, Chicago, with considerable buying on the part of consumers.

We quote, dealers' selling prices, f. o. b. Chicago, as follows:

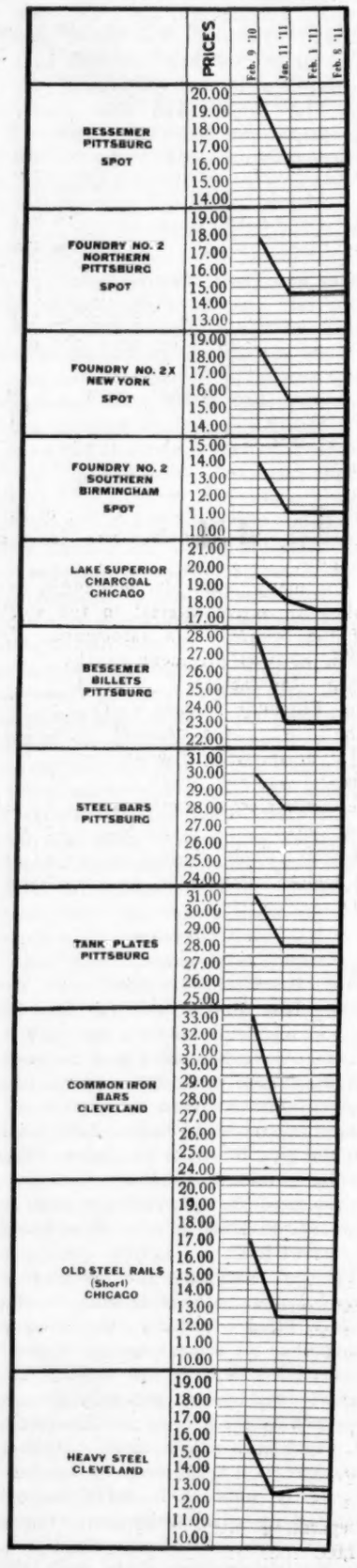
Lake copper, carload lots, 12⅞c; casting, 12¾c; smaller lots, 1¼c to ⅜c higher. Spelter, car lots, 5.40c to 5.45c, lead, desilverized, 4.45c, in 50-ton lots; corroding, 25c per 100 pounds higher; sheet zinc, $7.50 list, f. o. b. La Salle, in car lots of 600-pound casks; pig tin, 42c; Cookson's antimony, 10c; other grades, 9c to 10c.

Old Metals.—The tone of the old metal market is better. Price changes are fractional, however. Dealers' stocks are heavy. Consumers are showing moderate interest in their future requirements, but buying for immediate delivery is the most noticeable feature of the trade at present.

We quote, dealers' selling prices, f. o. b. Chicago, as follows:

Copper wire, 12½c; heavy copper, 12¼c; light copper, 11¼c; heavy red brass, 11c; heavy yellow brass, 9c; light brass, 7c; No. 1 red brass borings, 9¼c; No. 1 yellow brass borings, 6¾c; brass clippings, 8½c; tea lead, 3.80c; lead scrap, 4¼c; zinc, 4.60c; tin pipe, 38c; tin foil, 32c; pewter, 28c; electrotype plates, free from wood, 4c; electrotype dross, 3c; stereotype plates, 4½c; stereotype dross, 3¼c; linotype dross, 3¼c; prime slab zinc dross, $75 per ton.

PRICE CHART



McFADDEN RESIGNS

As Vice President and General Manager of Mackintosh, Hemphill & Co.

W. H. McFadden has tendered his resignation as vice president and general manager of Mackintosh, Hemphill & Co., Pittsburg, to become effective March 1, which has been reluctantly accepted by the directors of the company. Mr. McFadden will devote his time during the next few months to looking after his important gas and oil interests and in traveling for his health. The announcement of his resignation came as a distinct surprise to his many friends in the iron and steel business.

Mr. McFadden has been closely identified with the rolling mill industry for the past 25 years and has taken an active part in the construction and installation of many of the most important steel mills and is one of the most popular manufacturers in the country.

For many years Mr. McFadden has taken an active interest in the work of the foundrymen's association. In 1905, he was president of the Pittsburg Manufacturers' Association and the Pittsburg Foundrymen's Association. When the national convention of the American Foundrymen's Association was held in 1906, Mr. McFadden was elected president and served one year. For many years, he was actively identified with the National Founders' Association, as chairman of the third district.

More Capital Provided for Salisbury Company

At the recent annual meeting of the Salisbury Steel & Iron Co., Utica, N. Y., new directors were elected as follows: Edward L. Wells, William H. Switzer, Utica, N. Y.; Albert M. Mills, Little Falls, N. Y.; George C. Wing, Auburn, N. Y.; Henry N. Clark, Boston, Mass.; Herman W. Hoops, W. J. Myers, New York City. It was decided to increase the capital stock of the company from $1,000,000 to $2,000,000, with shares at par value of $100. It was also decided to issue $500,000 worth of 6 per cent bonds, the proceeds are to be expended on new mining equipment. The company has operated extensively during the past year in its magnetic iron ore tract in New York state, where, by means of a large crushing, grinding and electric separating plant, a daily capacity of 1,000 tons of high grade cobbed ore and concentrates has been attained. An electric generating plant has also been installed at the mines.

The officers of the company are: President, Edward L. Wells; vice president, William J. Myers; secretary and treasurer, William H. Switzer; assistant treasurer, Floyd R. Switzer.

Low Prices for Basic and Bessemer

Pittsburg, Feb. 8. (By wire.)

Arrangements are being made for a meeting of manufacturers of basic pig iron to discuss trade conditions. The date for the meeting has not been announced. Additional inquiries for basic and foundry pig iron are noted and several lots of basic are reported to have been sold at about $13.25, valley. Odd lots of Bessemer are understood to have been offered in this market below $15, valley.

Late New York News

New York, Feb. 8. (By wire.)

Prompt ferro-manganese under pressure to be sold has been offered consumers in the east at $37.50, Baltimore. The usual ruling price of this alloy is $37.75 prompt and $38 forward. Foreign makers of 50 per cent ferro-silicon are asking $1 advance for prompt over the future market, which is about $55 to $55.50, Pittsburg.

Reports that the American Bridge Co. will erect a plant at Birmingham and that the Carnegie Steel Co. has purchased land at the head of Chesapeake bay, in Maryland, for a new plant are officially denied.

Coke More Active

Pittsburg, Feb. 8. (By wire.)

Several furnace interests which have been buying coke in the open market from month to month, are quietly negotiating for their full requirements for the last half. Pending inquiries involve from 50,000 to 60,000 tons. Extremely low quotations on prompt furnace coke, noted recently, have been withdrawn.

American Can Meeting

The annual meeting of the stockholders of the American Can Co. was held Feb. 7, and the retiring directors were re-elected. The board has reorganized and has re-elected the old officers. The net earnings for the year ending Dec. 31 were $3,456,537, an increase of $154,860.

HALCOMB STEEL PLANT

Of Syracuse, Will be Absorbed by the Crucible Steel Co. of America.

Negotiations have practically been concluded whereby the Crucible Steel Co. of America, Pittsburg, takes over the plant of the Halcomb Steel Co., Syracuse, N. Y. The plant was built in 1905-6, and put in operation in 1906. It includes five 24-pot crucible steel melting furnaces with 120 pots, one 4-gross-ton electric furnace, one 20-gross-ton basic open-hearth steel furnace, 7 gas producers, 21 heating furnaces, 6 annealing furnaces, 5 trains of rolls and 9 steam hammers; specialty, the finest quality of tool steel; annual capacity, 20,000 tons of ingots and finished rolled, forged and drawn products.

C. H. Halcomb, president of the Halcomb Steel Co., was formerly president of the Crucible Steel Co. of America. Other officers of the company are: Vice president, F. B. Scott; secretary, F. E. Wade; treasurer, E. R. Hazard, chairman, L. C. Smith.

Erection of Panama Lock Work is Begun

Dispatches from Panama state that a force of expert iron and steel workers has arrived there to begin work upon setting and erecting the canal lock gates. Considerable equipment for the handling of the steel work has already reached the Isthmus. This includes two truss bridges, 134 feet 6 inches in length and 11 feet wide, which will be constructed over the lock chambers. On these bridges will be a railroad track, over which locomotive cranes will operate in handling the steel for the gates from the material yard along the locks. One 50-ton locomotive crane and another crane of less capacity, have been erected by the contractors at Gatun. The first shipment of fabricated steel for the lock gate work, which involves the enormous amount of 58,000 tons of steel, has been sent to the Isthmus from the shops of the fabricators, the McClintic-Marshall Construction Co.

Directors of the United States Radiator Co. have voted to remove the operating headquarters and general offices from Dunkirk, N. Y., to Detroit. The change will not be made until next July, as the new buildings at Detroit will not be ready for occupancy until then. F. W. Herendeen has been elected a director to succeed his brother, the late E. G. Herendeen.

Market Upturn Reflected in Furnace Activity

The production of coke and anthracite pig iron throughout the country in January was 1,766,658 tons, according to completed returns received from blast furnace owners and managers. This compares with the December output of 1,779,899 tons, a decrease in January of 13,241 tons, both months having the same number of working days.

MONTHLY PRODUCTION.

	1911.	1910.	1909.
January	1,765,995	2,599,995	1,788,164
February	.....	2,428,937	1,682,470
March	.....	2,588,736	1,822,644
April	.....	2,477,700	1,730,608
May	.....	2,374,802	1,866,757
June	.....	2,288,279	1,930,029
July	.....	2,158,124	2,088,620
August	.....	2,103,791	2,232,642
September	.....	2,048,461	2,375,589
October	.....	2,086,205	2,604,037
November	.....	1,910,385	2,532,740
December	.....	1,779,899	2,682,702
Total	1,765,995	26,845,314	25,337,002

However, the upturn in the iron and steel market first visible the latter part of January has been reflected in the increased number of stacks active on the last day of the month, a net total of 17 as compared with those blowing on the last day of December. However, almost all of these newly active stacks were lighted so late in the month that their output only operated to prevent the January production figures appearing worse than they do.

AVERAGE DAILY PRODUCTION.

	1911.	1910.
January	56,989	83,871
February	.....	86,747
March	.....	83,580
April	.....	82,590
May	.....	76,607
June	.....	76,276
July	.....	69,617
August	.....	67,864.
September	.....	68,282
October	.....	67,297
November	.....	63,679
December	.....	57,192

The daily average output in January was 56,989 tons, compared with 57,416 tons in December, a loss of 427 tons in January. The merchant furnaces continued to show effects of the curtailment, their production in January being 627,343 tons, compared with 652,534 tons in December, a loss in the merchant output in January of 25,191 tons. On the other hand, the non-merchant or steel plant furnaces made an output in January of 1,127,462 tons, compared with 1,108,022 tons in December, a gain in January of 19,440 tons.

The total number of stacks active on the last day of January was 210, compared with 193 on the last day of December, a net gain of 17 in January. In that month 20 stacks blew in and three blew out; eight being relighted in Pennsylvania, nine in Ohio, and one each in Virginia. Indiana and Missouri, while two were blown out in Illinois and one in Tennessee. The production of ferro in January was 8,026 tons, compared with 11,316 tons in December, a loss in January of 3,290 tons. The output of spiegel in January was 3,827 tons, compared with 8,027 tons in the preceding month, a loss in January of 4,200 tons.

Installing More Sheet Mill Furnaces

George J. Hagan, furnace engineer, People's Bank, Pittsburg, and sole licensee for the Bailey combination sheet and pair furnace, has received an order for two additional furnaces for the Canton Sheet Steel Co., Canton. These furnaces are of the single type, stoker fired. Work has just been completed on three more combination sheet and pair furnaces for the Berger Mfg. Co., also of Canton. This constitutes the sixth order received from this company. The Youngstown Sheet & Tube Co. Youngstown, O., is putting in more furnaces of the Bailey combination sheet and pair type. Mr. Hagan is at present engaged on considerable construction work for the American Rolling Mill Co., Middletown, O.

Orders for Railroad Equipment

Included in the railway equipment orders of the week are a total of 28 locomotives booked by the American Locomotive Co. from different lines. The Hocking Valley railway has ordered 10 consolidation freight locomotives of this builder; the Kanawha & Michigan railway, eight consolidation freight locomotives and two six-wheel switching locomotives; the Florida East Coast railway, five Pacific passenger locomotives and one consolidation freight locomotive, each for the Texas City Transportation Co., the Pittsburg, Summerville & Clarion railway and the Marion & Rye Valley railway. The Montreal Locomotive Works, Ltd., reports the receipt of an order for one Terney type of locomotive from the Brompton Pulp & Paper Co.

Mr. Mix Honored

Melville W. Mix, president of the Dodge Mfg. Co., Mishawaka, Ind., celebrated the twenty-fifth anniversary of his connection with that company on Jan. 25 at his residence and was attended by the principal officers and stockholders of the concern, with their wives. During the course of the evening a silver loving cup was presented to Mr. Mix by First Vice President W. B. Hosford, on behalf of the stockholders and the board

JANUARY PIG IRON.

STATES.	NO. OF STACKS.	NO. IN BLAST LAST DAY OF MONTH. JAN.	NO. IN BLAST LAST DAY OF MONTH. DEC.	TOTAL TONNAGE MAKE. MERCHANT.	TOTAL TONNAGE MAKE. NON-MERCHANT.	TOTALS. JAN.	TOTALS. DEC.
Pennsylvania	157	84	76	171,576	576,987	748,563	715,699
Ohio	71	46	37	131,508	277,665	409,173	374,285
Alabama	45	17	17	108,217	21,957	130,174	155,413
Virginia	24	9	8	28,484	———	28,484	29,626
New York	26	15	15	67,391	69,209	136,600	141,984
New Jersey	7	2	2	12,927	———	12,927	15,450
Illinois	26	9	11	37,130	78,818	115,948	147,679
Colorado	6	3	3				
Indiana	8	4	3	17,078	94,392	111,470	117,371
Maryland	4	2	2				
Wisconsin	6	3	3				
Kentucky	7	2	2				
West Virginia	4	1	1	36,222	8,434	44,656	41,299
Tennessee	19	8	9				
Washington	1	0	0				
Georgia	2	1	1				
Texas	3	0	0				
Minnesota	1	1	1	16,810	———	16,810	21,750
Michigan	3	2	2				
Missouri	1	1	0				
Spiegel—All states						3,827	8,027
Ferro—All states						8,026	11,316
Totals	421	210	193	627,343	1,127,462	1,766,658	1,779,899

Past Year Makes New Record in Exports

Exceeds Previous High Tonnage by Fifteen Per Cent—Ore Imports Increase Over Fifty Per Cent—Imports and Exports in Detail

The year 1910 made a new record in exports of tonnage lines of iron and steel by no less than 210,000 tons, or more than 15 per cent. The following table shows the exports and imports of all tonnage lines, including scrap, pig iron, unfinished steel, rolled iron and steel, etc., in gross tons:

	Imports.	Exports.
1902	1,206,811	372,398
1903	1,178,996	326,590
1904	266,398	1,167,710
1905	416,000	1,010,255
1906	577,809	1,325,740
1907	662,349	1,301,979
1908	205,845	964,242
1909	356,296	1,239,711
1910	487,972	1,535,698

The record year for exports had been 1906. Not only did 1910 show a gain of 210,000 tons over the tonnage of 1906, but the average degree of finish in 1910 was much greater, making the exports correspondingly more important. There was a decrease of more than 130,000 tons in exports of billets, sheet bars, etc., with an increase of about 35,000 tons in pig iron, making a net decrease of nearly 100,000 tons in these relatively crude materials, so that the gain in the more finished products from 1906 to 1910 was about 300,000 tons.

The imports of tonnage iron and steel products in 1910, 487,972 tons, exceeded those of some previous years, but fell far short of the previous years which were really active. The imports were confined almost wholly to scrap, ferro-manganese and spiegeleisen and tin plates, there being small tonnages imported of special steels and special grades of pig iron.

Crude Steel Exports.

Exports of billets, ingots, blooms, billets, sheet bars, etc., have varied widely in different years. In 1904, the first year of very heavy exports along this line, they were the largest on record, amounting to 314,324 tons, while in 1910 they were the smallest since that year, amounting to only 58,230 tons. The record of crude steel exports by months in 1910 is shown below, from which it will be observed that the great bulk of the year's exports occurred in the last three months:

January	3,080
February	5,167
March	266
April	168
May	180
June	2,241
July	126
August	2,025
September	4,480
October	15,493
November	17,695
December	10,880
Year 1910	58,230

Iron Ore Imports.

Our record of iron ore imports is shown in full in the following tables, from which it will be observed that 1910 broke the best previous record, made in 1909, by about 900,000 tons, or more than 50 per cent:

IRON ORE IMPORTS, CALENDAR YEARS GROSS TONS.

1903	980,440
1904	487,613
1905	845,651
1906	1,060,390
1907	1,229,168
1908	776,898
1909	1,694,957
1910	2,591,031

	1909.	1910.
January	105,233	284,823
February	61,749	170,427
March	108,676	163,633
April	74,782	206,135
May	97,393	240,833
June	124,714	193,415
July	172,316	248,810
August	209,855	282,949
September	164,613	208,892
October	179,505	219,571
November	174,976	197,833
December	222,609	.....
Totals	1,694,957	2,591,031

SOURCES OF IRON ORE IMPORTS.

	December.	Year.
Spain	16,367	439,868
Sweden	19,749	259,911
Canada	3,514	95,005
Newfoundland and Labrador	25,950	209,006
Cuba	101,930	1,451,096
Other countries	6,200	136,145
Totals	173,710	2,591,031

IRON AND STEEL EXPORTS, GROSS TONS.

	December,		Twelve months, ending December,	
	1909.	1910.	1909.	1910.
Scrap	403	4,716	25,360	25,825
Pig iron	4,076	11,419	61,989	127,385
Billets, sheet bars, etc.	3,625	10,880	104,862	58,230
Wire rods	2,362	1,572	20,142	22,869
Rails	53,151	41,593	299,540	353,180
Structural iron and steel	8,515	13,318	90,830	146,721
Bar iron	1,349	1,116	13,536	18,045
Steel bars	7,394	8,237	74,495	107,561
Sheets and plates	21,014	23,041	180,048	274,516
Tin plates	1,130	1,057	9,327	12,459
Barb wire	5,577	6,556	70,812	79,461
All other wire	7,407	7,342	78,529	92,467
Wire nails and spikes	3,075	4,260	30,656	42,870
Cut nails and spikes	705	496	9,936	8,129
All other, including tacks	713	765	7,464	10,202
Pipes and fittings	16,810	13,298	162,185	155,778
Totals	137,206	149,666	1,239,711	1,535,698

IRON AND STEEL IMPORTS, GROSS TONS.

	December,		Twelve months, ending December,	
	1909.	1910.	1909.	1910.
Scrap	22,080	2,621	63,504	72,764
Pig iron	28,607	19,911	176,442	237,233
Billets, bars and steel, n. e. s.	4,887	1,794	19,287	46,578
Wire rods	591	1,450	10,544	20,374
Bar iron	2,683	2,505	19,206	38,231
Sheets and plates	765	185	4,720	6,152
Tin plates	5,195	3,110	62,593	66,640
Totals	64,803	31,576	356,296	487,972

A New President

Eugene P. Thomas has been elected president of the United States Steel Products Co. to succeed James A. Farrel, who resigned to become president of the United States Steel Corporation. Mr. Thomas' first connection in the steel business was in 1892 with the present Lorain Steel Co. of the United States Steel Corporation. He became the London representative in 1899 of that company, the American Steel & Wire Co. and the Illinois Steel Co. Upon the formation in 1903 of the United States Steel Products Co., Mr. Thomas was placed in charge of one of the departments of the company and has served as chief assistant to the president.

Test of Blower

About 25 leading blast furnace engineers and superintendents were present at the Lynn, Mass., plant of the General Electric Co., Feb. 4, to witness the testing of the centrifugal blower just completed for the Iroquois Iron Co. for installation in its new blast furnace plant at Chicago. After witnessing the test, luncheon was served and R. H. Rice of the company presented a paper, fully explaining the machine's operations. Mr. Rice's paper dealt with the installation at the Oxford, N. J., plant of the Empire Steel & Iron Co., where the unit consists of a six-stage compressor operated at a normal speed of 7,650 revolutions per minute, and driven by a direct connected four-stage Curtis steam turbine.

Form Association.—Superintendents of the numerous manufacturing plants in Janesville, Wis., have organized as the Janesville Superintendents' Association. J. C. Nichols was elected president; Carl Buchholz, vice president; John Gollmar, secretary, and John Hennick, treasurer. Meetings will be held monthly.

CRUCIBLE EXPANDS

Issuance of Stock Authorized—May Take Over More Plants.

Pittsburg, Feb. 8. (By wire.)

The Crucible Steel Co. of America has authorized the issuance of the balance of its authorized preferred stock amounting to over 5,300 shares. The present outstanding preferred stock is $24,463,500, and a new issue will bring the total outstanding stock to $25,000,000. No explanation is forthcoming as to the purpose of the additional stock. In the absence of any official information it is reported that the additional stock will be used in payment for additional plants to be taken over, for which negotiations are pending.

Advertising Pays

At the annual meeting of the American Multigraph Sales Co., held Jan. 7, the number of directors was increased from seven to nine. New directors elected were: E. H. Parkhurst, vice president and general manager, of the Peerless Automobile Co.; Amos B. McNairy; A. S. Chisholm, assistant to the president of the American Steel & Wire Co., and C. K. Arter. President H. C. Osborn, of the Multigraph company, reported an increase in sales during the past year of 20.3 per cent over the preceding year. The last four months of the year showed an increase of 48.2 per cent over the corresponding period a year ago. It was stated that this large increase was due to an advertising campaign started by the company last year.

Personal

Cecil A. Grenfell, of London, Eng., representing British stockholders, has been elected chairman of the Southern Iron & Steel Co.

M. D. Sloane has been elected secretary of the Eastern Steel Co., with headquarters at 71 Broadway, New York, and works at Pottsville, Pa.

Frederick N. Garvin has been elected a director of the American Radiator Co. President Wooley is quoted as saying that the company's past year will compare favorably with previous years.

Herbert Shearer, former manager of the Chicago Brass Co., of Kenosha, Wis., and later general manager of the American Brass Co., has resigned to become general manager of the brass department of the Winchester Arms Co., New Haven, Conn.

W. E. McClamrock, vice president and sales manager of the Southern Engine & Boiler Works, Jackson, Tenn., has retired. W. G. Timberlake has been elected vice president of the company, and D. H. McDonald manager and superintendent.

Robert Mather, chairman of the board of directors of the Westinghouse Electric & Mfg. Co., has returned from a six weeks' business trip in Europe. Mr. Mather reports having found general business conditions in Europe very satisfactory, especially in Great Britain.

Edward Monaghan has been appointed superintendent of the shipping department of the Upper and Lower mills of the Carnegie Steel Co., Pittsburg, succeeding Kenneth McLean, who has been made superintendent of the shipping department at the Homestead Steel Works of that company.

C. W. Bryan, division contracting manager of the American Bridge Co. for the eastern district, with headquarters at New York, has been made chief engineer of the company, and A. L. Davis, assistant to the president, has been made division contracting manager of the company for the eastern district.

R. W. Bailey, sales manager of the Philadelphia office of the American Bridge Co., has been appointed contracting manager of the Pittsburg office of that company, effective Feb. 1, succeeding James A. Huston, who has severed his connection with that company to devote his time to private interests.

Adolph Stokdyk has been elected president of the Wisconsin Foundry & Steel Works, of Cedar Grove, Wis., to succeed John Gungers. Mr. Stokdyk has been secretary of the company for a number of years. Other officers elected at the annual meeting are: Vice president and treasurer, John Vander Wall; secretary, Elmer Ruslink; directors, the officers and Gerret Grotenhuis, W. Meinen and A. Fonteine. The business for 1910 was shown to have been very satisfactory by annual reports of the officers.

Stack Blown In

Increased requirements of pig iron and steel for finishing mill operations have caused the blowing in of an additional blast furnace at the Sparrows Point plant of the Maryland Steel Co.

Chairman E. H. Gary, of the United States Steel Corporation, has officially denied a report that the Corporation plans to retire within a year the outstanding $660,000,000 of 7 per cent, cumulative preferred stock. According to the statement, the preferred stock would be retired around 130.

Obituary

Harry Woodward Coleman, one of the partners of J. K. Dimmick & Co., died Jan. 30, at Sharon Hill, Pa.

William N. Whitely, prominently identified with the manufacture of harvesting machinery in Ohio for years, died Feb. 6, at Springfield, O., aged 76. Born in Clark county, O., a farmer's son, he developed into a mechanical genius. His earliest experiments in the way of inventing farming machinery were carried on in 1851 and in this and subsequent years he laid the foundation for what afterward became the once widely known Whitely company at Springfield.

John H. Tilden, who, for many years occupied a leading position among the manufacturers of Hamilton, Ont., died Feb. 1, aged 68, from an attack of pneumonia. He was born at Utica, N. Y., but came to Hamilton at the age of 25, taking a position as bookkeeper with the stove manufacturing firm of E. & C. Gurney & Co., and rapidly advanced until he became manager. When it was afterwards reorganized as the Gurney-Tilden Co., Mr. Tilden became the president. He was interested in several other industrial enterprises, being a director of the Canada Screw Co. and the Gurney Scale Co., and president of the Chapman Double Ball Bearing Co., of Toronto. He took an active part in civic affairs. Financial reverses led to his retirement from business a year or two ago.

Preparing to Sell Spanish Iron Ore

B. Granger Harrison, of London, representing the Spanish iron ore merchants, Sota & Agnar, is now in this country conferring with eastern blast furnace interests preparatory to opening the books for Spanish ore contracts for this year's delivery. Sota & Agnar are among the heaviest importers of foreign iron ore to the United States last year bringing in the bulk of the estimated movement of 450,000 tons of Spanish ore to this country.

The report of the Chicago Pneumatic Tool Co. for the year ending Dec. 31, shows gross earnings of $1,054,800, as compared with $558,928 in 1909; net profits $861,660, as compared with $418,760 in 1909; surplus, $436,976, compared with $250,610 in 1909.

Sarah stack of the Kelly Nail & Iron Co., Ironton, O., was relighted on Jan. 18.

The New York stock market last week touched the highest average prices since last May, and was about two points above the highest in October, which marked the recovery culmination from the slump of July. The bank statement issued Saturday did not come up to preliminary estimates of the gain in cash.

The market opened on Monday dull but firm, prices averaging higher at the close; reports of railroad earnings for December in several instances made an exceptionally favorable showing. On Tuesday, the average price of stocks reached the highest in months, Steel common and prominent railroad stocks leading the advance; announcement was made that Harriman railroads will spend $75,000,000 in the next five years in double tracking the Union Pacific and other parts of the system. Another advance to the highest average price since October took place Wednesday; the grain markets were firmer. On Thursday the market was distinguished by irregularity, but with Steel common and the copper stocks as leaders, prices averaged higher and closed firm; the Bank of England rate was unchanged at 4 per cent; commodity markets were quiet, but copper was reported a fraction higher. Less activity was shown by the market Friday, and prices averaged lower; bond market was active and firm; grain and cotton markets declined. On Saturday, stocks turned strong in the closing hour and prices closed firm and higher all around.

Call money during the week ranged from 2½ to 1½ per cent. Time money throughout the week advanced slightly, especially for the long periods, considerable loans being made at 3¾ per cent for six months. The actual condition of New York banks was reported as follows: Loans increased $9,752,200; deposits increased $12,105,700; surplus increased $44,750; and the percentage of actual reserve is 27.81, compared with 27.83 the previous week. Non-member banks and trust companies reported: Loans increased $18 994,300; net deposits increased $22,455,900; reserve increased $839,600, and the percencentage of reserve 17.4, unchanged from last week. Commercial failures for the week were reported as 342, compared with 351 the preceding week, and 298 the corresponding week last year. Bank clearings showed an increase of about 10 per cent over last week, but a decrease over last year of 5.5 per cent. Shares were sold to the number of 3,964,700, compared with 2,174,600 the preceding week and 4,865,700 the corresponding week last year. Bonds, exclusive of government bonds, were sold to the amount of $14,608,000, compared with $15,764,000 the preceding week, and $16,783,000 the corresponding week last year.

	Closing Quo. Feb. 4	Changes in week	Annual Meeting date 1911	Stock Outstanding	Basis	Dividend Last Dividend	Dividend Date Last Div. Pay.
Allis-Chalmers	8½	+ 5/8		$19,820,000		.....	.....
Allis-Chalmers, pr	33	+2	Nov. 2	16,150,000	7 cum.	1¾ Q.	Feb., 1904
American Can	9⅝	— ¼	Feb. 1	41,233,300		1¾ Q.	.....
American Can, pr	81¾	+ ¼		41,233,300	7 cum.	1¾ Q.	Jan., 1911
Am. Car & Fdy	56	+1¾	June 29	30,000,000		½ Q.	Jan., 1911
Am. Car & Fdy., pr	118⅛	+1⅛		30,000,000	n. c.	1¾ Q.	Jan., 1911
American Loc	41⅝	+1¼	Oct. 17	25,000,000	5	1¾ Q.	Aug., 1908
American Loc., pr	110	— ¼		25,000,000	7 cum.	1¾ Q.	Jan., 1911
American Ship	75	.....	Oct. 11	7,600,000	4	1 Q.	Sept., 1910
American Ship, pr	111	.....		7,900,000	7 cum.	1¾ Q.	Jan., 1911
Am. Steel Foundries	46¾	+1	Dec. 7	17,184,000		1¼ Q.	Feb., 1911
Barney & Smith	20	.....	June 6	2,000,000	4	1 Q.	June, 1908
Barney & Smith, pr	85	.....		2,500,000	8 cum.	2 Q.	Dec., 1910
Bethlehem Steel	33⅜	+ ½	April 4	14,862,000		.....	.....
Bethlehem Steel, pr	63½	+1⅝		14,908,000	7 n. c.	¾ Q.	Feb., 1907
Cambria Steel	45⅛	+ ⅛	Mar. 21	45,000,000	5	1¼ Q.	Feb., 1911
Cambria Iron	46	.....		8,468,000*	4	2 S. A.	Oct., 1910
Chicago Pneumatic Tool	47¼	+2½	Feb. 20	6,485,800	4	1 Q.	Jan., 1911
Colorado Fuel	36	+ ¾	Oct. 16	34,235,500		1¾ Q.	Apr., 1902
Crucible Steel	13⅞	+ ⅝	Oct. 18	24,578,400		3½.	.....
Crucible Steel, pr	80	+3		24,463,500	7 cum.	1¾ Q.	Dec., 1910
Empire Steel	5	—2	Feb. 22	1,254,770		.....	.....
Empire Steel, pr	55	.....		2,500,000	6 cum.	2 S. A.	Jan., 1911
Fay & Egan	70	.....	Feb. 21	1,000,000	6	3 S. A.	Feb., 1909
Fay & Egan, pr	110	.....		1,000,000	7 cum.	1¾ Q.	Nov., 1910
General Electric	155¼	+3⅛	May 9	65,179,600	8	2 Q.	Jan., 1911
Harbison-Walker	35	+1	Jan. 16	18,000,000		½ Q.	Dec., 1910
Harbison-Walker, pr	95	.....		9,600,000	6 cum.	1½.	Jan., 1911
International Pump	41⅜	+1⅛	Dec. 12	17,762,500		1 Q.	Nov., 1910
International Pump, pr	85¼	+ ¼		11,350,000	6 cum.	1½ Q.	Feb., 1911
Lackawanna Steel	40	+5	Mar. 8	34,978,000		.....	.....
Lake Sup. Corp	31½	+3	Oct. 4	40,000,000		.....	.....
New York Air Brake	76	+4	Mar. 8	10,000,000	8	1½ Q.	Jan., 1911
Niles-Bement-Pond	98	.....	Feb. 8	8,500,000	6	1½ Q.	Dec., 1910
Niles-Bement-Pond, pr	104	.....		2,000,000	6 cum.	1½ Q.	Nov., 1910
Otis Elevator Co	49	.....	Mar. 20	6,375,000	3	1½ S. A.	Oct., 1910
Otis Elevator Co., pr	96	.....		6,310,000	6 n. c.	1½ Q.	Jan., 1911
Pa. Steel	60	.....	May 8	10,750,000		.....	.....
Pa. Steel, pr	106½	+ ½		16,500,000	7 n. c.	3½ S. A.	Nov., 1910
Pittsburg Coal Co	20	+ ½	Feb. 10	28,104,600		.....	.....
Pittsburg Coal Co., pr	71	+3		27,071,800	7 cum.	1¾ Q.	Jan., 1911
Pressed Steel Car	35	+1¾	Feb. 15	12,500,000		1 Q.	Aug., 1904
Pressed Steel Car, pr	98¼	+1¼		12,500,000	7 n. c.	1¾ Q.	Feb., 1911
Pullman	161	.....	Nov. 8	120,000,000	8	2 Q.	Feb., 1911
Railway Stl. Spring	37⅜	+2⅝	Mar. 2	13,500,000	2	1 S. A.	Oct., 1908
Railway Stl. Spring, pr	99½	+1¾		13,500,000	7 cum.	1¾ Q.	Dec., 1910
Rep. Iron & Steel	34¾	.....	Oct. 18	27,191,000		.....	.....
Rep. Iron & Steel, pr	98½	+2⅜		25,000,000	7 cum.	1¾ Q.	Jan., 1911
Sloss-Sheffield	55	+5	Mar. 15	10,000,000	5	1¼ Q.	Sept., 1910
Sloss-Sheffield, pr	114½	.....		6,700,000	7 n. c.	1¾ Q.	Jan., 1911
U. S. Pipe & Fdy. Co	16	.....	June 28	12,106,300	2	1 Q.	Dec., 1910
U. S. Pipe & Fdy. Co., pr	54	+3		12,106,300	7 n. c.	1¼ Q.	Dec., 1910
U. S. Steel	81⅝	+3	April 17	508,302,500	5	1¼ Q.	Mar., 1911
U. S. Steel, pr	120⅞	+1½		360,281,100	7 cum.	1¾ Q.	Feb., 1911
U. S. Steel 5s	105	+ ⅜		463,798,000	5	.....	.....
Va. Iron, Coal & Coke	59½	— ¼	Sept. 19	9,073,680		5. †	Oct., 1907
Westinghouse Electric	70	+3⅛	July 26	3,998,700*		5¼ Q. **	Jan., 1911
Westinghouse Air Brake	144½	+4⅛	Oct. 3	13,750,000*		5 Q. ‡	Jan., 1911

Par value of shares, $100, except those starred (*), $50.
**Includes 3½ per cent on back dividends.
†Stock.
‡Includes 1½ extra and 1 special.

Copper Stocks.

New York.—Amalgamated Copper closed 66, a net gain of 3⅜.

Boston.—Butte Coalition closed 19½, a net gain of ½; Calumet & Arizona closed 55, a net gain of 5¾; Calumet & Hecla closed 520, a net gain of 15; North Butte closed 29, a net gain of 1¾. Quincy mining closed 67, a net gain of 1.

Wisconsin Steel Co. blew out its No. 2 stack on Jan. 21 for repairs, but expects to relight it about Feb. 11.

THE IRON TRADE REVIEW

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THE AVERAGE PAID CIRCULATION OF THE IRON TRADE REVIEW FOR THE ISSUES OF THE FOLLOWING MONTHS WAS:

February	5,703
March	5,754
April	5,793
May	5,827
June	5,842
July	5,864
August	5,875
September	5,895
October	5,955
November	5,993
December	6,026
January, 1911	6,058

February 9, 1911

May Be Bessemer Record

The production of pig iron in the United States in 1910 is officially reported at 27,298,545 gross tons, as detailed last week. The production of Bessemer pig iron (including the small tonnage of low phosphorus iron) was 11,244,612 tons, which compares with 10,557,370 tons in 1909, and indicates, according to the experience of previous years, a production of about 10,000,000 tons of Bessemer steel ingots and castings in 1910. This would fall about 2,250,000 tons short of the record output, made in 1906, and amounting to 12,275,830 tons. The presumption is that this will pass down into history as the record output of Bessemer steel in the United States. While total pig iron and total steel output have increased, operations by the Bessemer process have decreased, and there is no reason to infer that the tide will turn in the opposite direction. In years of full production, Bessemer steel is likely to show about 10,000,000 tons of output for years to come. There is no prospect of any important decrease in the tonnage.

Increased Railroad Operations

The monthly reports of railroad earnings published by the Interstate Commerce Commission continue to make a very favorable showing. The uniform accounting system was put into operation July 1, 1907, and the latest monthly report of the commission is for the month of October, 1910. Of course there are later and unofficial summaries, compiled from published reports of the leading roads, but it seems preferable, in studying the question of railroad operations and earnings, to take the official reports. Prior to the establishment of the uniform accounting system, it was well known that the railroads were prone to vary their policy from time to time in order to swell or diminish the apparent earnings. There has not been an entire absence of criticism since the new system was put into effect, but all the charges have been to the effect that since the rate issue became prominent nearly a year ago the railroads were prone to make their showings of net earnings as light as possible. Whether these charges were well founded or not, is not vital to the matter we desire here to present, since the figures show that railroad earnings of late have been quite satisfactory. If they are reported at less than they really were, the truth would simply make the argument so much more conclusive.

Inasmuch as the railroad mileage reporting is constantly increasing, comparative figures of total earnings over a series of years would be misleading, since of course total earnings should increase when the mileage is increasing, at the expense of increased capital investment. We therefore take for comparison the figures per mile of road reporting. For the three fiscal years July 1, 1907, to July 1, 1910, we give the average figures per month, so as to furnish a basis for comparison with the four single months after July 1, 1910, for which statistics have been prepared.

Rail Operations Per Mile of Line.

	Operating revenue.	Operating expense.	Net operating revenue.
Monthly average, July, 1907, to June, 1908...	$ 884.43	$616.20	$268.23
Monthly average, July, 1908, to June, 1909..	873.85	577.78	296.07
Monthly average, July, 1909, to June, 1910..	976.04	646.59	329.45
July, 1910	968.29	661.12	307.17
August	1,065.05	689.70	375.35
September	1,066.35	685.84	380.51
October	1,092.24	704.16	388.08

From the railroad standpoint, as indicated by arguments presented in the past few months in the rate discussion, the year ending June 30, 1908, is not a good one with which to begin a comparative statement, for the reason that business suffered a serious decline after the panic of October, 1907. Exactly comparable statistics, however, are not available for years earlier than July 1, 1907, when the uniform accounting system went into operation. From the statistics of Poor's Railroad Manual, rather striking indications can be furnished that the argument does not present any serious point. Poor's statistics show gross and net earnings per mile of road for many years, compiled according to prevailing methods. From these we observe that the year of largest earnings was the fiscal year 1907, showing $11,556 gross earnings per mile, or less than $1,000 per month, the net being $308 per month per mile of road. These figures are only slightly in excess of those for the fiscal year 1908. Going back only a few years, however, we find a long period in which the gross earnings varied between $6,000 and $7,000; from 1884 to 1898, inclusive, the gross earnings did not run outside these limits, making $500 to $600 per month, and not until the fiscal year 1905 did the gross earn-

ings ever reach an average of $800 per mile per month.

It is no more fair for the railroads to take the suddenly increased earnings of 1905-6-7 as the basis to which all future earnings should be adjusted than it is for them to take the period 1896-7-8 as furnishing the price basis to which their commodity and wage payments should be adjusted, because that period represented the lowest wages and commodity prices in recent times.

In the period during which gross earnings were averaging between $500 and $600 per month per mile of road, net earnings ranged from $150 to $200, averaging about $175. Compared with such a level, the earnings in recent times, both gross and net, are extremely high. An interesting feature of the railroad plea is that the added earnings from increased freight rates are desired not so much for the direct return which would thus be furnished as for the better showing which would be made, enabling the roads to borrow money. It would seem that if the railroads experience trouble in borrowing money, however, it is not because their earnings have become poor, but because they have exhausted their borrowing power by borrowing so much.

Coming to the recent past, as detailed in the foregoing table, it is to be observed that the fiscal years 1908 and 1909 showed practically unchanged operating revenue while the operating expense decreased and the net operating revenue showed a material increase. The next fiscal year, 1910, showed a large gain in gross and a moderate gain in net. The latter was smaller proportionately than the former, so that the operating ratio increased, but while a low operating ratio is an advantage, the actual amount of net operating revenue is the important thing, and if it increases, the railroad is better off.

The four months, July to October, inclusive, 1910, show very large operating revenue and much larger net revenue from operation. The large gain thus shown, it should be stated, is probably due in part to the period of the year. The corresponding months a year earlier had, in fact, run well ahead of the average of the fiscal year, but July to October last being comparable with the months a year earlier tend to give promise that the fiscal year 1911 as a whole will compare on even terms with the preceding fiscal year, and its showing is quite satisfactory, compared with the fiscal year 1908, or with all previous years except perhaps the particularly active years 1906 and 1907.

The iron trade can find particular comfort in the figures of operating revenue. They represent, substantially, the physical operations of the roads, and it is from the operation of the roads, from the wearing out of materials, that the iron trade will receive most of its business in the next few years. The time was that railroad orders came out in volume only when new railroads were being built or equipment was being increased, but conditions have changed. The great bulk of the railroad work has been done while the amount of business done by the railroads, which wears out material, steadily increases. The freight ton-mileage of the country doubles every 10 or 12 years, and that makes new business.

It should be remembered that the uniform system of accounting by which these data are obtained requires the setting up of depreciation accounts against all rolling stock, the deductions being made in operating expenses and before net revenue is ascertained. When the Interstate Commerce Commission promulgated the system the railroads complained loudly, insisting that the depreciation allowances were greater than necessary. It is well for them if they are, for if they complain of net earnings being inadequate, they still have the reserves for new equipment, which the system has compelled them to establish, and the spending of the funds from time to time will give the roads new equipment without taking money from net earnings or from loans.

Notice has been posted at the Ashland, Wis., charcoal furnace of the Lake Superior Iron & Chemical Co., reducing wages in all departments amounting to about 10 per cent.

INDUSTRIAL MUSEUM

May Be Established at Washington.—Relation to Foreign Trade.

Washington, Feb. 7.

A bill about to be introduced in the house of representatives by Representative J. Hampton Moore, of Pennsylvania, will provide for the establishment in Washington by the federal government of a national industrial museum of similar character, but more comprehensive in scope than that now conducted in Philadelphia by private enterprise. The new museum will not only be a repository for models and actual machines by which the various stages in the evolution of any particular enterprise may be traced as an aid in the design of new apparatus, but is intended to serve as a valuable adjunct to the department of commerce and labor in promoting our foreign trade.

The knowledge which American manufacturers will glean from the Panama exposition, chiefly concerning foreign machinery and methods employed in its manufacture, will no doubt be very useful in adjusting home production to the ever-varying conditions of export sales. But the outlay of money involved in the exposition will be great, and the American manufacturers do not wish to stop there. A permanent exhibit of various types of machinery at Washington under the auspices of the department of commerce and labor would certainly be a great aid to foreign importers as well as to buyers in domestic trade, and enable the bureau of manufactures, which Mr. Moore says has degenerated into an editorial sanctum for blue-pencilling and publishing consular trade reports, to perform the duties which the law contemplates but fails to provide means for their execution.

The department of commerce and labor is now spending $80,000 annually for office rent. This represents $2,000,000 invested at 4 per cent, which would be ample to construct the museum and give that department of the government which is charged with the duty of promoting manufactures and foreign and domestic trade not only the aid of a gigantic and national advertising agency for American machinery, but a suitable office building surrounded by the products of the industries which it was created to foster.

Thomas Furnace Co., Milwaukee, is erecting two new firebrick stoves, 18 x 90 feet, under patents held by T. E. Thomas, of Niles, O. The stack is idle.

BY-PRODUCT PLANT

At the Soo Will Soon be Completed —Contracts for Koppers Ovens.

The by-product coke oven plant which H. Koppers has been building for the Lake Superior Corporation, at Sault Ste. Marie, Can., will be completed about the middle of this month. No. 1 battery of 55 ovens is now ready and will be producing coke in about a month. The brick work on No. 2 battery of 55 ovens is all completed and will be ready to produce coke in six weeks. In spite of all kinds of engineering difficulties, the plant will be completed on time according to contract, which establishes a record for coke oven construction in this country.

The American office of H. Koppers, Joliet, Ill., has just been advised by its home office at Essen, Germany, of the following new contracts, totaling 286 ovens:

One hundred and twenty ovens, with by-product plant for 240 ovens, for the Zeche Kaiser Friedrich, Westphalen, Germany; 75 ovens, with by-product plant, for the Ewald Co.; 15 ovens for the Deutsch-Luxemburgische Bergwerks & Hutten-Aktiengesellschaft for the Friedrich Wilhelms Hutte, in Mulheim Ruhr, Germany, the third repeat order for this company, making a total of 195 ovens; 20 ovens from Gluckhauf Tiefbau for the Deutsch-Luxemburgische Bergwerks & Hutten-Aktiengesellschaft; 56 ovens from Kolner Bergwerksvereins for the plant at Emscher, Germany.

Motor Plant Purchased

It is announced that the plant of the E. R. Thomas Motor Co., of Buffalo, has been purchased by Eugene M. Meyer Jr. & Co., bankers, of New York, subject to the approval of the creditors. The business will be reorganized with a capitalization of $2,000,000.

Added Department

The Rochester Bridge Co., of Rochester, Ind., has added another department to its activities in a structural department. This will be in charge of Daniel Duffin Jr., formerly assistant sales manager of the structural steel department of George W. Jackson, Inc. While the Rochester company has never up to this time entered extensively into the structural field, with the completion of new shops, it has prepared to care for increasing trade. It has just increased its capital stock to $100,000 common stock and $50,000 preferred stock.

Cincinnati Steel Foundry is Sold

After a receivership of three years, during the greater part of which it has been closed down, the steel foundry belonging to the Steel Foundry Co., of Winton place, Cincinnati, was sold on Feb. 2, by Judge Lueders, in the insolvency court. The sale was made to W. S. Freeman and Penbrook Bishop, of Chicago, for $44,000.

It is said that operating will be resumed within 60 days. One furnace will be rebuilt and a number of minor changes made in the interior of the plant. Due to the deterioration of the plant since it has been closed and in view of the present unsettled business conditions, the price paid by the purchaser, though far below the cost of the plant, is considered a fair one. Several attempts have been made to sell this property during the past years which have fallen through.

Metal Trades Convention

Extensive preparations are being made by the officers of the National Metal Trades Association for a program of surpassing interest to be presented before its members in the thirteenth annual session at Hotel Astor, New York City, on April 12-13. Acceptances have been received from several noted speakers who will present addresses on topics of keen interest to employers of labor, especially at this time.

At the annual meeting of directors of the Globe Seamless Steel Tubes Co., of Milwaukee, these officers were re-elected: President, F. W. Renshaw, Chicago; vice president and treasurer, Lawrence Fitch, Milwaukee; secretary, H. L. Davis; general manager, Geo. J. Thust; night superintendent, Ira Lutton. The new plant at Thirty-third avenue and Burnham street, Milwaukee, is now in operation and about 500 are employed.

The American Brass Co. has declared a regular quarterly dividend of 1¼ per cent and an extra dividend of ¼ per cent, making 1½ per cent in all.

The Baxter Stove Co., Mansfield, O., has increased its capital stock from $100,000 to $200,000.

BIGGEST BOATS

On Lakes Will be Built For W. P. Snyder With Cambria Steel.

William P. Snyder, of Pittsburg, president of the Shenango Steamship Co., has awarded contracts to the Great Lakes Engineering Works, of Detroit, for two bulk freighters to be larger than any now afloat. They are to be 617 feet over all, 64 feet beam and 34 feet deep, with a carrying capacity of 14,000 gross tons of ore on 19 feet draught. Their construction will require 8,500 tons of steel shapes and plates, which will be purchased from the Cambria Steel Co. It will be seen that the two steamers are to be 12 feet longer, 4 feet wider and 2 feet deeper than any bulk freighter on the lakes. It is understood that they will be built in the ordinary way and not on the Isherwood system. Their engines are to be quadruple-expansion, with cylinders 23, 33, 48 and 69 inches diameter, with 42-inch stroke, supplied with steam from three Scotch boilers. They are to come out in 1912 and are to be built in anticipation of the completion of the third lock at the Sault, which will be 25 feet deep.

An ore deal between Snyder and the Cambria Steel Co. is also connected with the order for boats.

M. M. Broad has withdrawn from partnership in the American Iron & Supply Co., Chicago, effective Feb. 1, and has taken active charge of the Chicago Scrap Iron Co., First National Bank building, as president and treasurer. The latter company will conduct a regular brokerage business in iron and steel scrap.

The Canadian government has appointed H. W. Hodge, an engineering expert, of New York, and M. J. Butler, general manager of the Dominion Steel Corporation, finally to settle the differences of opinion among the board of engineers having charge of the construction of the Quebec bridge.

The American Radiator Co. has declared the usual quarterly dividend of 1¾ per cent on preferred stock, payable Feb. 15, and the usual quarterly dividend of 2 per cent with the usual extra year-end dividend of 3 per cent on common stock, payable March 31.

The furnace of the St. Louis Blast Furnace Co., St. Louis, was blown in Jan. 28.

ANNUAL REPORT

Of Warwick Iron & Steel Co. for Period Ending Dec. 31.

The report of the Warwick Iron & Steel Co., Pottstown, Pa., for the fiscal year ending Dec. 31 last, has been published. The board of directors, through President Edgar S. Cook, thus summarizes the year's business:

The business outlook for 1910—one year ago—appeared bright and promising. There was an optimistic feeling throughout the business community. Before the close of the first quarter of the year, indications were that pig iron was being produced in excess of consumption. The falling off in demand and market prices were gradual, up to June 1. The last half of the year has been marked by rapidly declining prices, consequent upon increased competition. Following upon the decreased demand for iron, No. 3 furnace was blown out April 26. It is now idle. It can be put into operation on comparatively short notice, and at a moderate cost, should business conditions improve. No. 1 furnace was blown out to be re-lined, May 24, being restarted July 24. At the date of this report, No. 1 furnace is in successful operation. No. 2 furnace ran continually throughout the year. It will be necessary to re-line this furnace during 1911. For the year, our total product was 254,182 tons of iron. On June 1, $15,000 of bonds were paid and cancelled. Outstanding bonds are now $180,000. Dividends on capital stock were paid as follows: May 15, 3 per cent; Nov. 15, 4 per cent.

The construction of ore-handling machinery became a necessity, in order to handle the additional tonnage of raw material, following upon the increased product of No. 1 and No. 2 furnaces, and also by changed conditions as respects our ore supplies. The cost of this machinery, known as an ore bridge, was $67,452.90. It has been charged to real estate, plant and equipment account. This account has also been increased by the purchase of certain meadow land, on the east of our furnace plant, and also of a limestone farm adjoining the Bassler limestone quarry, the total cost amounting to $51,394.00.

Furnace stack "A" now in course of construction, is for use as an alternate stack, whenever No. 1 or No. 2 furnaces may be undergoing repairs. Arangements will be made, so that the "A" stack can be operated with the equipment of either No. 1 or No. 2 furnaces. It was considered an advantageous investment, in view of the fact that the equipment is now so duplicated that it can be kept in continuous operation, while a furnace stack proper must be put out of blast at intervals, in order to make necessary renewals. The net earnings for 1910, as per balance sheet attached, are $274,060.92.

The business outlook is not encouraging, whatever may be the cause. Pig iron is urged upon the market in excess of demand. This condition does not pertain to any particular district, but refers to every district making pig iron and steel.

The balance sheet as of Dec. 31, shows the following:

ASSETS.

Cash		$ 101,369.92
Accounts receivable, etc.		558,336.36
Pig iron, raw materials, etc.		872,327.86
		$1,532,034.14
Real estate, plant, etc.		2,284,864.97
		$3,816,899.11

LIABILITIES.

Accounts payable, etc.	$ 851,674.18
For general repairs, etc.	244,300.66
	$1,095,974.84

CAPITAL AND SURPLUS.

Capital stock	$1,499,715.00
Surplus, balance Jan. 1, 1910	1,078,399.89
Less earnings, etc.	274,060.92
Less dividends	104,536.40
Doubtful accounts charged off	26,715.14
Total deductions	$ 131,251.54
Balance Dec. 31, 1910	$1,221,209.27
	$3,816,899.11

Satisfactory Showing on Year's Business

At the annual meeting of the stockholders of the Detroit Steel Products Co., Detroit, recently, a large increase in the year's business in all departments was shown. Directors were re-elected as follows: Henry M. Campbell, J. H. Avery, C. H. Hecker, John C. Rumney, Walter S. Russel, Henry Russel and Henry W. Dakin. The directors organized by choosing these officers: President, Walter S. Russel; vice president, John C. Rumney; treasurer, Henry W. Dakin; secretary, H. E. Hado. The usual quarterly dividend of 1¼ per cent was declared, payable Feb. 15, and also an extra cash dividend of 3 per cent, payable Feb. 1, this making a total of 10 per cent for the year.

Phelps Iron & Steel Co. Takes New Agency

The Phelps Iron & Steel Co., 701 Provident Bank building, Cincinnati, district sales agent for the Eastern Steel Co., the Franklin Steel Co., the United States Rail Co., the Keystone Steel Co., and the Wisconsin Steel Co., has taken over the selling agency of the Ashea Coal & Mining Co., of Wasioto, Ky., and is also selling agent for the West Virginia Coal & Coke Co. The Phelps Iron & Steel Co. has just been incorporated in the state of Ohio for $10,000 by Carlisle Murdock, Florence C. Murdock, Griffith L. Resor, Blanche S. Phelps and Edward C. Phelps. The company had previously been incorporated under the laws of West Virginia, the change having been made because the company's home offices are now located at Cincinnati.

PASSENGER STEAMER

Will be Built for D. & C. Navigation Co. by American Ship Building Co.

The American Ship Building Co. has secured the contract to build the new passenger steamer for the Detroit & Cleveland Navigation Co., to be known as the City of Detroit. The new steamer will be 60 feet longer and 1 foot wider than the City of Cleveland, being 470 feet over all, 55 feet beam, 93 feet over guards and 22 feet deep. Her engines will be compound with three cylinders 62, 92 and 92 inches diameter by 102-inch stroke, supplied with steam from four double-end and two single-end Scotch boilers. She will go into commission in June, 1912. Frank E. Kirby is her designer and Louis Keil will have charge of the decorative features. She will be built at Wyandotte and work will be started upon her at once.

The Carnegie Steel Co. will finish the shapes and plates, about 2,500 tons, for the new boat.

Regarding the new bulk freighter building for Rogers, Brown & Co., to be named in honor of William C. Agnew, of which mention was made in THE IRON TRADE REVIEW, Jan. 26, the word mining was through the ingenuity of the types twisted into marine and thus Mr. Agnew was translated into a world in which he never was. He is not identified with lake marine interests, but is very prominent in mining interests, having been for years the general manager of the great Mahoning mine, at Hibbing, and consulting engineer for the Susquehanna mine, also at Hibbing, the property of the Rogers-Brown Iron Co.

Ready to Operate

At the annual meeting of the Union Furnace Co., of Ironton, O., held at its office in Cincinnati, Jan. 31, the following directors were elected: D. B. Meacham, J. K. Pollock, H. E. Turner, F. W. Miller, R. D. Meacham. Officers were elected as follows: President, J. K. Pollock; vice president, D. B. Meacham; secretary and treasurer, H. E. Turner; assistant treasurer, F. W. Miller; assistant secretary, S. S. Littlejohn; manager, W. M. Jefferys. It was reported that the furnace stack had been rebuilt and was ready for its lining.

Dunbar Furnace Co. took the blast off its Dunbar, Pa., stack, Jan. 9.

OLIVER PLOW WORKS

Building in Canada is Going Forward to Completion.

Toronto, Can., Feb. 7.

The statement recently circulated that the Oliver Chilled Plow Works had ordered operations on its Hamilton, Ont., plant suspended until the reciprocity question is settled, is entirely unfounded. Friday the company called for tenders on an assembling building, three stories and basement, 90 x 406 feet, of steel and reinforced concrete, the cost of which is estimated at about $200,000, as provided for in the original plans. In about two weeks this will be followed by the erection of the malleable and gray iron foundry, 135 x 576 feet, one story, and plans will be prepared for the other buildings as rapidly as possible. The forge and machine shop is already in operation, and the power house will be finished by the middle of the month.

Contracts for New Westinghouse Foundries

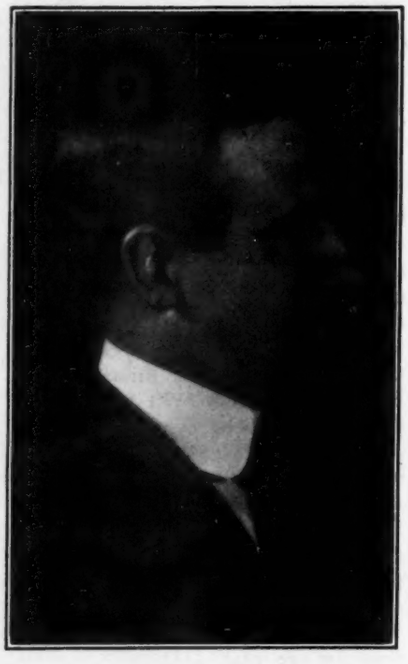
The Westinghouse Electric & Mfg. Co., Pittsburg, has awarded a contract to the American Bridge Co. for two of the new foundries to be erected at Trafford City, Pa., plans for which were outlined some time ago. One of the buildings will be 250 x 500 feet and the other 65 x 200 feet. Other buildings will include a third foundry building, pattern shop and power house. Between 2,000 and 3,000 tons of structural steel will be required. Preliminary work on the foundations has been started and it is likely that bids for the necessary equipment will be invited in the near future. As announced some time ago, the foundry plants of the Westinghouse company eventually will be grouped at Trafford City, and the present plants at Northside, Pittsburg, and Cleveland, O., likely will be abandoned.

The New President of Ryerson & Son

Clyde Mitchell Carr, recently elected to the presidency of Joseph T. Ryerson & Son, Chicago, as announced in THE IRON TRADE REVIEW Jan. 26, has been prominently identified with the iron, steel and machinery interests of the central west for many years. His connection with the firm of which he is now the head, dates back 21 years. He is a member of the American Iron and Steel Institute, director of the Corn Exchange National Bank of Chicago, Chicago Great Western railroad, Gisholt Machine Co., Madison, Wis., and president of the Lennox Machine Co., Marshalltown, Ia.

Mr. Carr was born in Illinois in 1869, and is the son of Richard Baxter and Margaret Mitchell Carr. He prepared for Princeton at Lake Forest academy, and was later a student at Northwestern university. In 1894 he married Lillian Van Alstyne, of Evanston. His home is at Lake Forest, Ill.

In addition to his business activities, he is closely connected with various public institutions in the city of Chicago, being a trustee of the Art Institute, Orchestral Association, Chicago Bureau of Public Efficiency, Chicago City Plan Commission and Lake Forest University. He is a member of a number of social organizations, including the Chicago, Commercial, Onwentsia, University, Cliff Dwellers, Princeton, Mid-Day and Saddle and Cycle clubs.



CLYDE MITCHELL CARR.

Going Into Steel Casting Business

William E. Hill & Co., Kalamazoo, Mich., who have been manufacturing saw mill machinery for many years, are going extensively into the steel casting business. To this end they have made a considerable addition to their steel foundry and but recently secured the services of one of the best steelmakers in the country.

PRIVATE RAILROADS

Involved in Important Decision Soon to be Made by Commission.

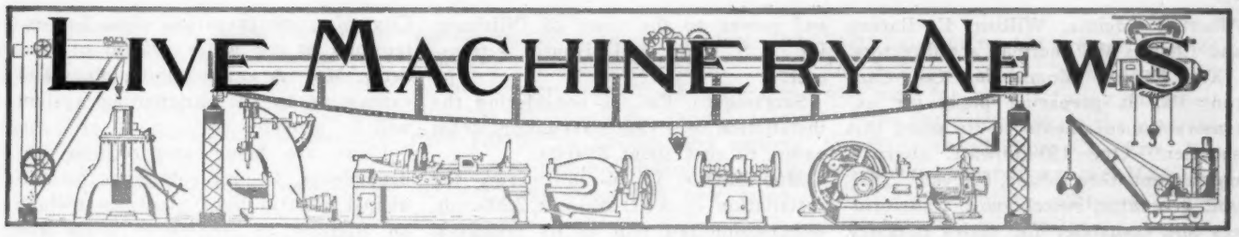
Chicago, Feb. 7.

Keen interest is being manifested by officials of industrial and railroad corporations throughout the country in a ruling that is expected from the interstate commerce commission in the so-called Manufacturers' Railway case, which involves the question of the right of common carriers to make divisions of through rates with private lines not doing a general railway business. It developed Saturday that the commission has just blocked a move by the Chicago & Eastern Illinois railroad which had for its purpose a resumption of the old plan of paying the Manufacturers' Railway Co. $4.50 a car for switching services. This cannot now be done until a decision on the legality of this method of doing business can be made.

This matter is of considerable interest to the iron and steel trade because a large number of steel manufacturers and others own private switching railroads operating on their own property or within the bounds of their own plants and not doing a general railway business. In delivering freight to these companies, all the trunk railroads have to do is to set the car in on the private line, the manufacturers doing their own switching. For this switching service, the railroads have allowed a certain portion of the through freight rate. The manufacturers claim that this is only a legitimate charge, since they are taking on themselves a service which would otherwise have to be performed by the trunk railroad, but other shippers have complained that the practice amounts to an unfair rebate since the amount paid out for switching services is a matter of private negotiation. One remedy that has been suggested is to have the privately owned lines, or tap roads as they are called, incorporate so as to come under the jurisdiction of the interstate commerce commission in handling interstate business.

A. L. and M. I. Goldstein, of Joseph Nagusky & Co., 855 East Sixty-seventh street, Cleveland, have bought the interests, yard and equipment of Nagusky & Co. The business of handling iron and steel scrap will be continued under the firm name of A. L. & M. I. Goldstein. They were formerly of L. Goldstein & Sons.

LIVE MACHINERY NEWS



Machinery markets generally, were quiet last week. This condition was noticeable particularly in the middle west. The chief feature of interest was the appearance, in New York, of an extensive list of machine tools issued by the New York, Ontario & Western Railroad Co. The sum involved is about $75,000. It is expected that other lists will be submitted to the machinery trade in this territory in the near future. The New York second-hand machinery market shows more activity. In Pittsburg, several fairly large contracts were closed and the market showed some activity. Pittsburg dealers report more general buying on the part of the railroads. There is a heavy demand for power plant and electrical equipment. In Cleveland, it is expected that the Lake Shore & Michigan Southern railway will soon submit a tentative list of machine tools for its Elkhart, Ind., shops. In Chicago, the heaviest demand is for electrical machinery. A number of large concerns have recently purchased property in a new manufacturing locality near Indiana Harbor, but definite plans have not yet been made. In the south, a number of projects for water works and electric light and power plants are about to be carried out.

Railroads

The Boston & Maine Railroad Co. has issued a list of machine tools for its repair shops at Lyndonville, Vt.

The Louisville & Nashville railroad is planning the establishment of shops at Winchester, Ky. They will be used in connection with the extension of the Lexington & Eastern which the L. & N. is building.

The New York, New Haven & Hartford Railroad Co. is planning an addition to its power station at Coscob, Ct. The new building will be 111 x 244 feet, one story in height. Edward Gagel, New Haven, is chief engineer of the company.

The Cincinnati, New Orleans & Texas Pacific railway will shortly let a large contract for machinery to be installed in its shops at Ferguson, near Somerset, Ky. Stokers, with which all engines on the road are equipped, are manufactured in these shops. Car shops are to be erected at Ferguson within the next few months.

The Delaware & Hudson Railroad Co. has closed on the small list of machine tools put out about two weeks ago, and it is believed that the company will come forward with an extensive inquiry very soon. Plans have been under way for over a year for the erection of a new repair plant at Watervliet, N. Y., and additions to the present one at Green Island, N. Y.

Foundries

The Favorite Stove & Range Co., Piqua, O., is reported to be contemplating the erection of a new foundry.

The Carroll Foundry & Machine Works, Bucyrus, O., is reported to be about to begin work on a large addition.

The Simpson Brothers Co., Portsmouth, O., is making arrangements to go into the foundry business more extensively.

Jones & Hopkins Mfg. Co., Nashville, Tenn., stove founder, is erecting a $10,000 addition to its foundry and warehouse.

The Youngstown Bronze & Iron Foundry Co., 548 Poland avenue, Youngstown, O., is preparing to enlarge the capacity of its plant.

Plans for an extension to the foundry plant of the Reznor Stove Co., Mercer, Pa., are being prepared by W. E. Barr, engineer, Erie, Pa.

J. L. Cypher, of the National Foundry Co., Connellsville, Pa., and others have purchased a tract in that city with the intention of establishing a foundry. Arrangements are now being made regarding the construction work.

The Vanadium Metals Co., East Braintree, Mass., has let contract for a new foundry to be erected at Groton, Mass. The work is to begin immediately and the company will employ about 50 men in the new building on completion.

Power Plant Equipment

The Smithfield, Ky., Milling Co. is in the market for steam power equipment for a 100-barrel mill.

The Spalding Electric Co., Glen Ellyn, Ill., will install a 150-horsepower boiler and two generators in the near future.

Columbus Bierce, Lee building, Memphis, Tenn., is asking for prices on two high-pressure boilers, 56 inches x 18 feet, 150 pounds working pressure, with two drums, 10 inches x 10 feet.

The Kenton Gas & Electric Co., Kenton, O., is contemplating the erection of a large new plant to cost approximately $600,000.

The Patapsco Electric & Mfg. Co., Ellicott City, Md., is contemplating the instalation of a gas producer and gas engine. Otto Wunder, superintendent.

Preparations are being made by the Grand Island Electric Co., Grand Island, Neb., T. H. Fritts, manager, for the installation of a 350-kilowatt generator and engine.

The Mammoth Springs Electric Co., Mammoth Springs, Ark., is considering the installation of a 1,000-kilowatt generator. E. C. Bellamy is secretary and manager of the company.

Henry B. Monning, John F. McCarthy and others of Fort Wayne, Ind., are preparing to ask bids for the construction of a central heating plant in the business district of Fort Wayne.

The Richmond, Ky., Electric & Power Co. has filed a deed of trust providing for the issue of $30,000 worth of bonds, of which $20,000 will be used for extensions and improvements of the power plant.

The public service commission for the second district, New York, has authorized a bond issue of $13,500 by the Easthampton Electric Light Co., for improvements to the company's plant and distributing system at Easthampton, Long Island, N. Y.

The Vincennes Electric Co., Vincennes, Ind., has been incorporated to establish and equip a plant for the generation of electrical energy for heating, lighting and power purposes.

Albert J. Heintz, William E. Barnes and Charles W. Sherman are directors.

The Canton Illuminating Co., Canton, Pa., is preparing plans for extensive improvements to its plant this summer. One 150-kilowatt, alternating-current, three-phase, 60-cycle, 2,300-volt generator, switchboard, transformers and controller for series tungsten lamps will be necessary.

The Boone Electric Co., Boone, Ia., John Reynold, president and manager, is considering the purchase of four 300-horsepower boilers, one 500-kilowatt, three-phase, 60-cycle, 2,300-volt, generating unit; one 200 - kilowatt, direct-current, 500-volt motor generator set for street railway service, switchboard, etc.

A. P. White & Co., flour millers, Cadiz, Ky., will erect a new mill in the next few months, and will be in the market for an engine to be used in a reserve power plant, and also for electric equipment with which to operate a 50,000-bushel grain elevator. Hydro-electric power will be used to operate the mill proper.

Charles C. Moore & Co., San Francisco, has received the contract for designing and erecting a 300-kilowatt plant including turbo-generators and Wheeler condensers for the Vancouver Portland Cement Co. It has also been awarded the contract to complete the 3,000-kilowatt power plant of the Mt. Hood Railway Co., at Portland, Ore.

Following out the plan of reorganization of the Lexington & Interurban Railways Co. and allied properties in central Kentucky, stockholders of the company will meet at Lexington, Mar. 6, and turn over the property to the Kentucky Securities Co., a new corporation formed for the purpose. Approximately $1,000,000 is to be spent in improvements, half of which will go into a new power plant.

Public Works

Kingsport, Tenn., is considering the establishment of water works.

Springfield, O., is considering the installation of a new 15,000,000-gallon pump.

L. E. Chapin, Frick building, Pittsburg, Pa., is preparing plans for a pumping station for Andover, O.

Portsmouth, Va., has voted $600,000 worth of bonds for the construction of a municipal water works system.

The board of water commissioners, Baltimore, Md., will soon call for bids on a new triple-expansion vertical pump.

The Dillsburg, Light, Heat & Power Co., capitalized at $15,000, has been formed to supply electric light, heat and power to the town of Dillsburg, Pa. J. S. Kapp, of Dillsburg, is treasurer.

Sacramento, Cal., is considering the installation of a 15,000,000-gallon steam pump, to cost about $100,000.

Madisonville, O., is considering the installation of a 100-kilowatt, 2,200-volt, direct-connected unit in its municipal light plant.

Mishawaka, Ind., is planning to erect a pumping station in East Mishawaka. The power will be electricity. Bids will be advertised for.

The city of Strathcona, Alta., will call for bids at once upon machinery for its new $72,000 electric light plant. Address the city engineer.

Monticello, Ark., has been given permission by the state legislature to issue bonds for the purpose of establishing a lighting plant and water works.

Tellico Plains, Tenn., has issued bonds for the construction of a water works system. Chisholm & Osborne, Charlotte, N. C., are preparing the plans.

Additions and improvements to the municipal electric light plant at Mt. Olive, Ill., are contemplated, including the installation of an additional water tube boiler.

Canton, O., is considering an appropriation of $66,545 for improvements to its water works. A new motor and pumps, and engine and generator are included.

Erie, Col., is considering the enlargement of its electric light plant about May 1, 1911. A new boiler, larger generator and a heating plant are included in the plans.

Kenton, Tenn., is in the market for engines, pumps and other equipment to be used in connection with a system of water works. R. C. Huston, Memphis, is consulting engineer.

Michael A. Welsh, mayor of South Amboy, N. J., has recommended the appointment of a committee to consider the advisability of establishing a municipal electric lighting system for the city.

Improvements are to be made in the municipal lighting plant at Nicholasville, Ky., of which E. J. Glass is manager. A 150-horsepower boiler and 75-horsepower steam engine will probably be bought.

Mt. Olive, Ill., is preparing to make extensive improvements to its municipal electric light and power plant. An additional boiler, a generator and an engine will probably be advertised for. O. A. Voepel is the manager of the plant.

L. G. Knapp & Co., consulting engineers, 535 Beals building, Kansas City, Mo., are preparing plans for extensions to the water system of Moberly, Mo. A new pumping plant and extensions to the distributing system will be provided for.

Plans are being prepared by Independence, Ia., for enlarging the municipal electric light plant, to include an addition to the power house and the installation of a 250-kilowatt generator and engine. E. R. Stanard is superintendent of the plant.

The commission on water and commissioners of public works, Buffalo, N. Y., have approved the purchase of three 5,000 horsepower steam turbo-electric generators from the Westinghouse Machine Co., for the new water works pumping station of that city.

Tipton, Ind., will probably install a 500-horsepower boiler, a dynamo, and make other improvements to its electric light plant in the spring. N. Hiatt is the superintendent of the plant.

The lighting plant at Rio, Wis., mentioned briefly in these columns previously, will be constructed by the Columbia Electric Light & Power Co., Pardeeville, Wis., and will require one 150-horsepower boiler, one 125-horsepower and one 100-kilowatt, three-phase, 60-cycle, alternating current generator.

W. G. Cornell Co., New York, has been awarded the contract for the building of the sewage disposal plant, electric power plant, and the installation of elevators for the new insane hospital of Schuylkill county, Pa. The contract for the main buildings has been placed with Edward Fay & Sons, Philadelphia.

Bids will be received until Mar. 1, by the borough of Coraopolis, Pa., on the following equipment: One 1,500,000-gallon triplex pump; one 150-horsepower gas engine; two 225-horsepower gas engines; one 75-horsepower gas engine; three generators, 15 - panel switchboard, complete; 150-light series luminous or metalic flame arc lamp equipment, complete.

Plans are being considered by Troy, Ala., for enlarging the electric light and power plant. This will include the installation of a 150-horsepower boiler; one 250-kilowatt, three-phase, 60-cycle generator, direct-connected to steam unit; one electrically operated pump having a capacity of 2,500 gallons per hour. A. B. Campbell is superintendent of the electric light plant.

The city of Durand, Mich., will make extensions to its municipal electric light plant and will require one 200-kilowatt and one 75-kilowatt generator, a 275-horsepower engine and a

50-horsepower alternating motor to operate pumps. A bond issue of $12,000 has been authorized by the city to cover the cost of these improvements. H. S. Rosenkrans is manager of the plant.

Tupelo, Miss., will soon issue bonds to pay for improvements to the municipal electric lighting plant. Larger engines are to be installed and the system will be changed from direct to alternating current. W. H. St. John is superintendent of the plant.

The city of Coshocton, O., will receive bids until Feb. 21, for a 4,000,000-gallon pumping engine and two centrifugal pumping units of 15,000,000 gallons capacity per day.

New Works

Plans are being prepared by Spang-Chalfant & Co., for a new machine shop to be erected at Etna, Pa.

The Hazelton Iron Works, Hazelton, Pa., is contemplating the erection of a new plant in the near future.

A two-story brick manufacturing building is being erected at Copeland Station, Pa., by the Pittsburg Tool Co.

The Lockport Stamping Co., Lockport, N. Y., is reported to be considering the erection of a plant at Findlay, O.

A 50 x 100-foot extension to the plant of the Youngstown Iron & Steel Co., Youngstown, O., will be erected this year.

The Rome Wire Works, Rome, N. Y., will add a one-story, steel and brick mill, 100 x 134-feet, to its plant in that city.

Improvements to be made at the Brackenridge, Pa., plant of the West Penn Steel Co. include an addition, 78 x 200 feet, to the bar mill.

The Goodman Mfg. Co., 4834 Halsted street, Chicago, is contemplating an addition to its Chicago factory but details have not been decided upon.

The Steel & Radiator Co., Ltd., has been granted a site of five acres by the ratepayers of St. Catherines, Ont., and will erect a $50,000 plant to employ 250 hands.

The Houston Structural Steel Co., Houston, Tex., is planning an addition to its plant. It is expected that the capacity will be increased to 100,000 tons a month.

The Bessemer Gas Engine Co., Grove City, Pa., is receiving bids on equipment for a new 40 x 70-foot forge shop, and on machine tools for the new machine shop.

C. B. Atterbury, Hillsboro, Ill., is contemplating the erection of a plant for the manufacture of road-making machinery, gang plows, seeders and other agricultural implements.

The Leader Iron Works, Decatur, Ill., has increased its capital stock from $100,000 to $200,000 and expects to do considerable building during the year and to install new equipment.

The Youngstown Tile & Steel Roofing Co., Youngstown, O., will soon locate its plant at Hubbard, O. A 200 x 300-foot building will be erected at Jackson Heights, a suburb of Hubbard.

The California Steel Monolithic Co., San Rafael, Cal., is planning to erect a large factory on the Golf Link tract, that city. William Mooser, Union Trust building, San Francisco, is the architect.

The Sterling Electric Co., La Fayette, Ind., has been incorporated by Samuel T. Murdock, Thomas Duncan, A. B. Wallace and others for the purpose of establishing a plant to manufacture electrical devices and appliances.

The Pierce Motor Co., Racine, Wis., owned by the J. I. Case Threshing Machine Co., is building a $25,000 assembling shop, 50 x 100 feet, one story high, of brick and steel construction. It will be used for assembling Case automobiles.

The National Adding Machine Co. has filed articles of incorporation at Nashville, Tenn., giving its capital stock as $15,000. Charles Wales, J. C. Woodward, R. H. Hardwood and others are incorporators. A plant will be erected at once.

The Joan d'Arc Co., Belleville, Ill., plans to construct a plant for the manufacture of packless valves and ice making plants. The building will be 585 x 80 feet. This company recently purchased the Howe Mfg. Co., Louisville, Ky., for $250,000.

The Greenwood Advertising Co., Knoxville, Tenn., is having plans drawn for a factory for the manufacture of metal electric signs. The company will be in the market for metal-working machinery. R. F. Graf & Sons, Knoxville, are the architects.

The Simms Magneto Co. has purchased equipment inquired for some time ago, amounting to about $5,000. This equipment is for the company's tool room in the new factory which is being built at Watsessing, N. J. A list of general machinery requirements for the plant is now being prepared.

Well Brothers, manufacturers of plumbing supplies, Chicago, have purchased from the New Hampshire Savings Bank, the southwest corner of Lake and Desplaines streets, Chicago, 59 x 115 feet. This property adjoins on the east the present plant of the company and will be improved and used for manufacturing purposes.

Plans for extensions to the plant of the Hammermill Paper Co., Erie, Pa., are being prepared by the Hunting-Davis Co., engineers, Pittsburg. The improvements will include: An extension to the finishing department, 130 x 290 feet, and an extension to the machine room, 75 x 218 feet. Additional equipment will be installed in the power plant.

The Racine Tool & Machinery Co., Racine, Wis., has started operations in its new plant on Junction avenue and is now employing a large number of men in addition to the old force, the floor space and capacity having been nearly doubled. Additional equipment is now being installed. Orders for further equipment will be placed as needed.

The general contract for the factory building of Shapiro & Aronson to be erected at 24 Morton street, Brooklyn, N. Y., has been let to Frederick A. Waldron, industrial engineer, 137 Wall street, Manhattan. The plans specify a five-story and basement building 100 x 100 feet. The equipment will include metal working machinery for the manufacture of chandeliers.

Chas. L. Barker, Norwalk, Ct., manufacturer of gasoline engines, is contemplating the erection of an addition to his plant to accommodate it to the manufacture of the Murray auto truck. The trucks will be for heavy business purposes, with carrying capacity of three tons. The name of the concern will be changed from the Barker Motor Works to the Barker Co., but it will continue to manufacture gasoline engines as heretofore.

The Nicola Building Co., Pittsburg, has been awarded the general contract for the new buildings for the Orenstein-Arthur Koppel Co.'s plant at Koppel, Pa. The structural steel contract, amounting to 350 tons, has been given to the Pittsburg Bridge & Iron Co. The following buildings will be erected: A carenter shop, 50 x 100 feet; erection shop, 50 x 220 feet; tool-storage room, 25 x 50 feet; machine shop, 75 x 75 feet; tool repair shop, 25 x 50 feet; car shop, 75 x 140 feet; addition to power house, 25 x 75 feet. There will also be a crane runway 140 x 275 feet. The following contracts for equipment for the plant have been awarded: Two 250-horsepower water tube boilers to the Federal Engineering Co., Pittsburg, to be manufactured by the Oil City Boiler Works; a 300-horsepower, tandem, compound, Buckeye steam en-

gine, manufactured by the Buckeye Engine Co., Salem, O., to Joseph T. Castle, Pittsburg; electric generator, switchboard and appliances, manufactured by the Garwood Electric Co., Garwood, N. J., to Ludwig, Hommel & Co., Pittsburg; a 1,100-foot air compressor, manufactured by the Ingersoll-Rand Co., New York, to W. P. Brendlinger, Pittsburg; automatic stokers to the Westinghouse Electric and Mfg. Co.

Miscellaneous

S. G. Hunter Iron Works Co., Atlantic, Ia., has purchased a 24-inch punch and shear, a 10 x 12-inch air compressor and two electric motors, 7½ and 40-horsepower respectively.

The Lucas-Wallace Mfg. Co. has been organized at Paducah, Ky., for the manufacture of a patented carburetor for gasoline engines. Harry Wallace and Frank Wallace are those interested in the new plant.

The Seaton Spring Wheel Co., Indianapolis, Ind., has been incorporated to manufacture wheels, tires and automobile parts. The capital is $10,000 and the incorporators are B. C. Seaton, W. B. Cooley and W. H. Nusbaum.

The Shahan-Corley Co. has filed articles of incorporation at Chattanooga, Tenn., with capital stock $30,000. The company will manufacture saw mills and other machinery. J. W. Gavender, W. J. Shahan and W. B. Garvin are the incorporators.

Twin City Boiler Works, Bristol, Tenn., is in the market for machinery. The company has decided to double the capacity of the present plant, and will make the improvements at once. Henry Ehert is president of the concern.

The Brown Automatic Connector Co. has incorporated at Chattanooga, Tenn., with $50,000 capital stock. The company will make a patented device for connecting railroad cars and air signals. The incorporators include W. H. Meacham, A. L. Kirkpatrick and E. L. Whitaker.

The Westinghouse Electric & Mfg. Co. has received an order from the Pemberton Coal & Coke Co., Affinity, W. Va., for a 150-kilowatt, 250-volt, 200-revolutions per minute, direct-connected, engine type generator, a main station switchboard and a 150-kilowatt sub-station motor generator set.

The Anaconda Copper Mining Co. will in the near future build a large addition to its present smelter at Anaconda, Mont., which will be used for the treatment of slimes, to procure by concentration the copper values of the now waste product. Bids will be requested next month by the purchasing department for approximately 30 tons of steel, also steel shafting, pulleys, conveyors, etc.

H. G. Peake, for the past six months chief engineer for the Yuba Construction Co. and the Boston Machine Shop Co., and previous to that time with the Bucyrus Co., at South Milwaukee, has entered into a partnership with W. W. Johnson to engage in the business of designing and building placer mining dredges. The firm will be known as the Union Construction Co. and will have headquarters at 604 Mission street, San Francisco.

The Bessemer Gas Engine Co., Grove City, Pa., reports that its business in 1910 showed an increase of 58 per cent over the preceding year. Among the orders booked recently by this company are: A 15-horsepower Bessemer engine for the Kittanning Clay Products Co.; a 50-horsepower engine for the Bahmann Iron Works Co., Cincinnati; a 35-horsepower Bessemer for Charles Rosentiel & Son, Cincinnati; a 35-horsepower Bessemer for the C. W. Loughead Co., Cincinnati; a 10-horsepower Bessemer for the American Natural Gas Co., Apollo, Pa.; one 30-horsepower and one 35-horsepower Bessemer for Heneghan & Hanlon Co., Sistersville, W. Va.; a 50-horsepower Bessemer for the Valvoline Oil Works, East Butler, Pa.; a 40-horsepower Bessemer and a 20-horsepower Bessemer direct-driven pump for the Producers & Refiners Oil Co., Oil City, Pa.; a 25-horsepower Bessemer for the Hutchison Mfg. Co., Wilkinsburg; a 150-horsepower Bessemer direct gas engine driven compressor and a 40-horsepower and a 135-horsepower Bessemer engine to the Great Western Mining Co., Joplin, Mo.; two 35-horsepower Bessemer direct gas engine driven compressors for the Avalon Oil & Gas Co., Bremen, O.; two 50-horsepower and one 35-horsepower compressor for the Carter Oil Co.; two 50-horsepower compressors to the Blair Oil & Refining Co., Muskogee, Okla.; one 70-horsepower and two 80-horsepower direct driven gas engine compressors for the Empire Gas & Fuel Co., Ltd., South Bolivar, Pa.

Government News

Navy Supplies.

Bids are invited by the bureau of supplies and accounts, navy department, Washington, as follows:

Until Feb. 21:—500 pounds banding for use as condenser tube packing, for delivery at Norfolk, schedule 3328; 40,000 fire brick, Brooklyn, schedule 3328; 3,500 pounds black chain iron, Brooklyn, schedule 3325; 80 plumbago crucibles, Brooklyn, schedule 3328; 25 separator flasks, Newport, schedule 3320; 25 separator head forgings, Newport, schedule 3320; 1,050 pounds bellows leather, Brooklyn, schedule 3321; 5,800 pounds asbestos millboard, Charleston, S. C., schedule 3321; 2,000 feet flexible steel wire rope, Brooklyn, schedule 3325; 1,400 feet brass voice tubing, Portsmouth, schedule 3326; 12,000 pounds condenser tubing, Brooklyn, schedule 3330; 350 dozen hack-saw blades, Boston, schedule 3325; 400 dozen hack-saw blades, Brooklyn, schedule 3325; miscellaneous steel bolts and nuts, Brooklyn, schedule 3325; 500 rectangular casting brushes, Boston, schedule 3328; miscellaneous emery cloth, Boston, schedule 3325; 564 twist drills, Brooklyn, schedule 3325; miscellaneous twist drills, Boston, schedule 3325; miscellaneous hardware and tools, Boston and Brooklyn, schedule 3325; three hydraulic jacks, Brooklyn, schedule 3325; 400 scoop shovels, Brooklyn, schedule 3328; 330 machinists' hand taps, Boston, schedule 3325; 2,000 pounds round naval brass, Philadelphia, schedule 3330; 1,200 pounds rod and sheet brass, Newport, schedule 3317; 14,600 pounds naval brass rod, Brooklyn, schedule 3330; 1,800 pounds brass rod, Brooklyn, schedule 3326; miscellaneous phosphor bronze, Newport, schedule 3317; 13,700 pounds Tobin bronze, Newport, schedule 3317; 4,590 pounds sheet lead, Boston, schedule 3326; 2,000 pounds sheet lead, Charleston, S. C., schedule 3327; 21,700 pounds black steel angles, Portsmouth, schedule 3327; miscellaneous steel bars, class A, Brooklyn, schedule 3329; 1,700 pounds steel bars, class B, Charleston, S. C., schedule 3327; 22,500 pounds medium steel channels, Norfolk, schedule 3327; 9,500 pounds steel forgings, Newport, schedule 3318; 119,500 pounds hot-rolled or forged steel, Washington, schedule 3318; 500 pounds nickel steel rod, Newport, schedule 3318; 6,100 pounds cold-rolled machine steel, Newport, schedule 3318; 9,550 pounds hot-rolled machine steel, Newport, schedule 3318; 3,450 pounds hot-rolled steel plate, Newport, schedule 3318; 36,650 pounds medium steel plate, Boston, schedule 3327; 35,500 pounds medium steel plates, Portsmouth, schedule 3327; 4,500 pounds galvanized steel plate, Charleston, S. C., schedule 3327; 2,700 pounds cold-rolled steel rod, Brooklyn, schedule 3327; 77,700 pounds galvanized sheet steel, Brooklyn, schedule 3327; 340 pounds drill tool steel rod, Newport, schedule 3318; 22 sheet tin boxes, Boston, schedule 3326; 15,000 pounds sheet zinc, Philadelphia, schedule 3329; 48,000 pounds white lead, Philadelphia, schedule 3324; miscellaneous bibb cocks, Brooklyn, schedule 3332; miscellaneous brass pipe fittings, Philadelphia, schedule 3332; miscellaneous brass pipe fittings, Brooklyn, schedule 3332; 3,600 feet wrought iron or steel pipe, Philadelphia, schedule 3329; 6,300 feet steel tubing, Brooklyn, schedule 3326; miscellaneous brass tubing, bronze, etc., Newport, schedule 3317; 950 brass unions, Brooklyn and Philadelphia, schedules 3322 and 3332; miscellaneous brass and gate valves, Brooklyn, schedule 3332.

Until Feb. 28: Four sets turret turning gear, Portsmouth, schedule 3336; one set turret turning gear, Boston, schedule 3337.

Until March 14: One hydraulic duplex intensifier.

Bids opened Jan. 31 at the bureau of supplies and accounts, navy department, Washington, were as follows:

TRANSFER TABLE.—Furnishing and erecting transfer table for 100-ton Gantry crane at Indian Head, Md.: Niles-Bement-Pond Co., New York, $2,860; Rawles-Cobb Co., Boston, $4,980.

MOTOR.—One 100-horsepower induction motor, 3-phase, 60-cycle, 2,200-volt, 720 revolutions per minute, for heavy service: Allis-Chalmers Co., Milwaukee, $1,331; General Electric Co., Schenectady, $1,635; Reliance Electric & Engineering Co., Cleveland, $1,552; Westinghouse Electric Co., Pittsburg, $1,642; Wagner Electric Manufacturing Co., St. Louis, $1,574.38.

Engraving and Printing.

Bids are invited by the bureau of engraving and printing, treasury department, Washington, until Feb. 27, for the following: About 300,000 square inches 0.195 micrometer gage steel plate; about 200,000 square inches steel plate ¼ inch thick; 10,000 square inches 0.192 inch thick for transfer dies; 96 dozen steel rolls, carefully turned with mandrel holes so reamed that face will be parallel to axis.

Sheet Metal Building Material in South Africa

"The principal roofing used in South Africa is corrugated iron, the great bulk of which is imported from Great Britain," says U. S. Consul E. N. Gunsaulus, at Johannesburg. "A few of the public and best residential buildings have clay tiles, both of local and foreign manufacture, but the clay tiles are not extensively used on account of their greater cost. In metal roofing there has been no tendency to depart from the corrugated iron, which finds place in 99 out of every 100 buildings erected. For all ordinary buildings the corrugated iron is used, while for some of the better class of houses the French or Spanish types of clay tiles are in use.

"Up to this time metal tiles and shingles have scarcely been introduced, and their adoption by architects and builders could only be brought about by the manufacturers clearly setting forth their advantages, from the artistic as well as other points of view, over the corrugated sheets so commonly in use. A point in favor of the corrugated iron is its cheapness and the lower customs duty to which it is subject, the duty on this article being only 3 per cent advalorem, while on the metal shingles and tiles a duty of 15 per cent is levied. On the other hand, the metal shingles and tiling are much more ornate, and it is possible a good trade might, with proper effort, be established.

"The imports of corrugated and galvanized iron into this consular district for the calendar year 1909 amounted to $939,348, of which Great Britain furnished $911,362; the United States, $25,187; all other countries, $2,799. It thus appears that 97 per cent of this trade, which is large and constantly growing, went to Great Britain last year.

"The local retail prices for corrugated iron roofing, which comes in sheets 2 feet wide, ranges from 10½ to 12½ cents per running foot for No. 24 and No. 26 gage, No. 24 gage being almost No. 26 gage, No. 24 gage being almost entirely used for roofing purposes.

"Steel ceilings are very largely used in house construction here, particularly in business and residential buildings, and a good business is done in this line by American manufacturers, some of whose products are exclusively sold by local dealers. The imports of steel ceilings are not classed separately in the customs returns, hence it is impossible to give figures as to the value of the import trade in this line of goods, but it is large and certainly worth cultivating by American manufacturers. A list of the principal importers of sheet metal building materials, together with names of architects and builders in Johannesburg, Pretoria, Bloemfontein and Rhodesia is on file in the bureau of manufactures."

The Pacific Northwest Foremen's Association, of Seattle, Wash., elected the following officers for the present year: President, P. J. Givnan, superintendent Kilbourne & Clark Mfg. Co., Seattle; vice president, T. H. Haley, Ballard Drop Forge Co., Ballard, Wash.; secretary and treasurer, A. H. Garrison, United Metal Trades Association, 30 Pioneer building, Seattle.

Triumph Generators and Transformers

The Triumph Electric Co., Cincinnati, has recently perfected a line of alternating and direct current machines, including alternating current generators and transformers and three-wire direct current generators. In Fig. 2 is shown one of the line of new power and lighting transformers. These are built for single phase alternating current circuits, for a normal frequency of 60 cycles, but the frequency limits are from 50 to 140 cycles. All sizes are built of the pole construction, shell type for standard voltages of 1,100 to 2,200 for the primary and 110 to 220 for the secondary.

Transformer cases are made of gray iron and for sizes up to 10-kilowatt-volt-ampere capacity, are smooth, while for larger sizes the case is corrugated to increase the radiating surface. A feature is the device provided for lifting the case. By lifting a transformer by an eye-bolt screwed into the cover, the cover is often cracked. The transformers over 5-kilowatt-volt-ampere size have two lugs cast solid with the case under which a rope is slung. All small sizes have eye-bolts in the covers.

Instead of the usual nut and rod extending to the bottom of the case, four dogs engage the projections on the core clamps and the lugs cast on the inside of the case. When spread by a nut and lock washer, they wedge the core and coils securely in position.

Aside from mechanical construction, transformer losses are the most important consideration of design. Low core losses often produce excessive copper loss and poor regulation. Unnecessary

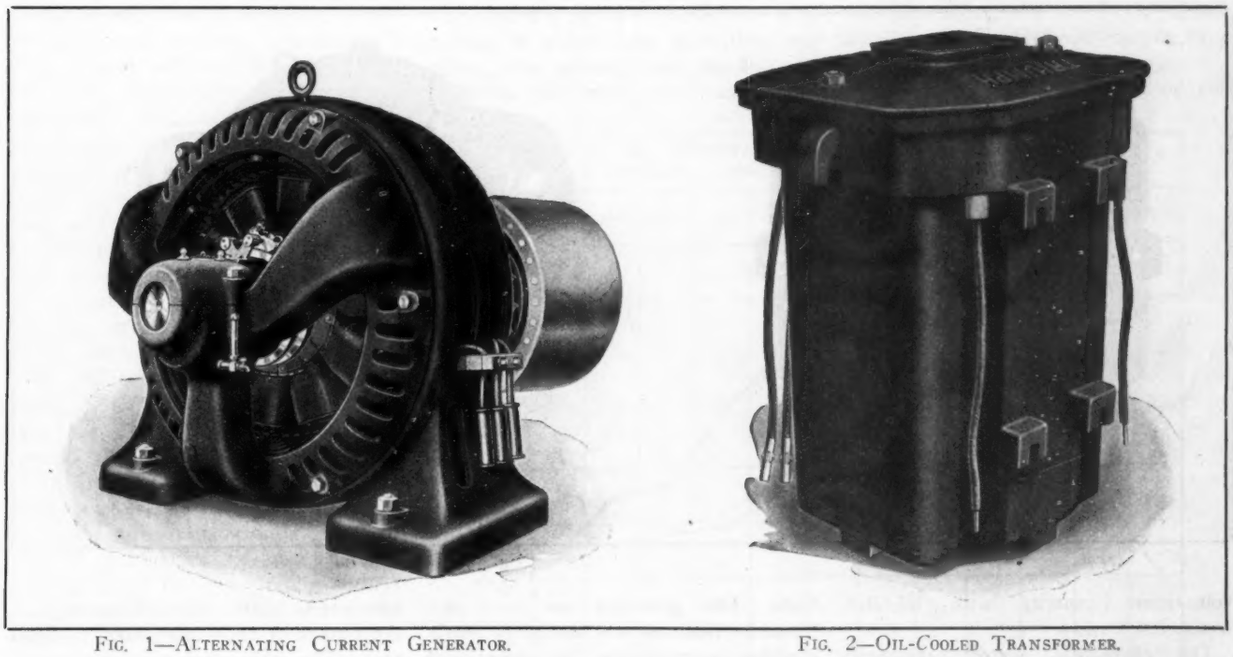


FIG. 1—ALTERNATING CURRENT GENERATOR.

FIG. 2—OIL-COOLED TRANSFORMER.

insulation causes high reactance, poor regulation and overheating, with a low efficiency. Core losses are continuous and while they should be eliminated as far as possible, regulation should not be sacrificed to secure low core loss, as a poor regulating transformer decreases the life of the lamps. In these transformers, silicon alloy, non-aging steel with a high permeability is used to reduce both copper and core losses. The core losses of these transformers are based on a sine wave in accordance with the defined standard of the American Institute of Electrical Engineers.

Up to 75-kilowatt-volt-ampere capacity the transformers are built with oil-filled cases, non-circulating. From 75 to 200-kilowatt-volt-ampere capacity, they are made with oil-filled, self-cooled cases and from 200 to 1,000-kilowatt-volt-ampere capacity with oil-filled, water-cooled cases.

The alternating current generators built by this concern are of the stationary armature and revolving field type for direct connection, belt or engine drive for one, two or three-phase circuits, and for 240, 480, 600, 1,200 and 2,400 volts, at 25 or 60 cycles. Belted and coupled type machines are built in capacities from 50-kilowatt-volt-ampere upwards to engine type machines in capacities from 75-kilowatt-volt-ampere upwards. Careful attention has been given to the ventilation of the coils and rotor by making the armature ducts large and directly placed so that the revolving field drives air through the armature coils. With an inductive load of arc lamps or induction motors, the generators will operate at full load capacity continuously with a temperature not exceeding 35 degrees Cent. With a non-inductive load and unity power factor the temperature rise for continuous operation is 40 degrees Cent. The use of a relatively large amount of copper in the stator and windings keeps down the copper loss and establishes a high efficiency. In Fig. 1 is shown the compact and rigid design of the frame, which is of steel construction.

A three-wire generator, Fig. 4, of an improved design is also being built by the Triumph Electric Co. The generators are made in all standard sizes from 25-kilowatt capacity upwards, supplying direct current at 250 and 125 volts from either side of the three-wire system.

The use of a two-voltage machine in shops having variable speed motors gives a wide range of speed with the use of a field control, and at the same time saves a large amount of copper. The chief objection to three-wire machines has been the commutation on unbalanced loads. This generator has been perfected to eliminate this and gives nearly sparkless commutation on unbalanced loads. Standard machines will take an unbalanced load of 25 per cent. Balancing coils supplied with the three-wire generators consist of three inter-connected windings upon laminated iron cores mounted in a cast iron case.

These three-wire generators differ from single voltage machines only by the addition of three collector rings on the shaft and the balancing rails. The armature is tapped and connections made to the rings, which supply current through low resistance carbon brushes to the balancing coils. The latter are inter-connected and the middle point is brought out to form the neutral wire of the three-wire system.

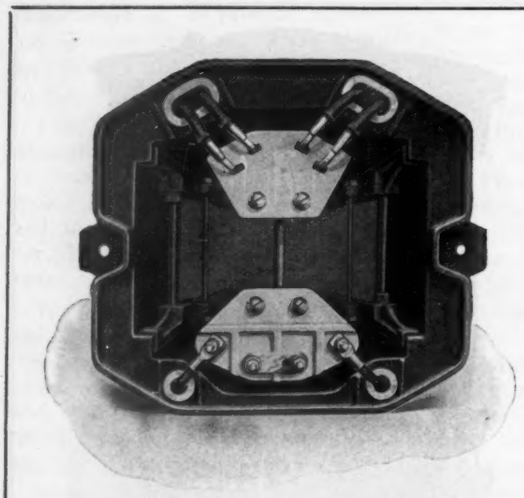


FIG. 3—TRANSFORMER TOP.

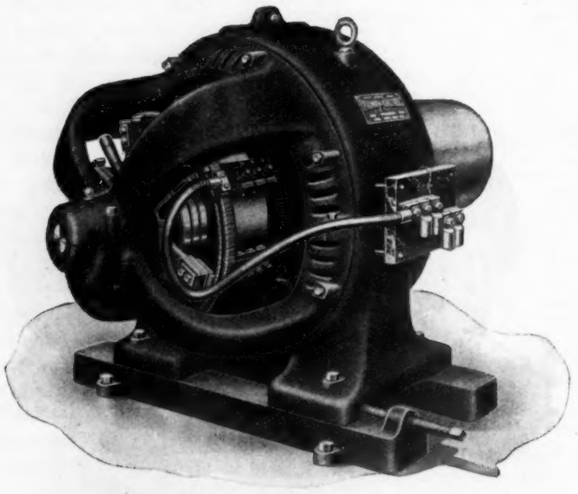


FIG. 4—THREE-WIRE GENERATOR.

Half of the January output of the Ivanhoe Furnace Co.'s Virginia stack was low phosphorus iron, containing less than 0.035 per cent phosphorus.

Request to Restore Bounty on Rods

The Dominion Steel Corporation is endeavoring to bring influence to bear upon the Canadian government to induce it to restore the bounty on steel rods, which expires in June next. General Manager M. J. Butler is at present in Ottawa in the interests of the Corporation. It is contended that as the manufacturing interests will be placed in a disadvantageous position in some respects by the proposed tariff changes the bounty should be retained as a compensatory measure.

Mr. Butler states that at present the pig iron output of the Steel Corporation amounts to 800 tons per day. The steel output is now 26,500 tons per month, the production of rails amounts to 13,000 tons per month, and the output of rods from 8,000 to 9,000 tons. The rail market is in an exceptionally healthy condition, owing to the activity of railroad construction. Three cargoes of rails are now on the way from Sydney to Prince Rupert by water, via Cape Horn. The steel plant at Sydney now employes about 3,000 men, and 1,500 more are employed in getting out iron ore and limestone. The coal branch is employing 6,000 men, and the force will be largely increased next summer.

Contract for the new Pingree building to be erected in Detroit, was last week awarded to the Detroit Bridge & Steel Co. This award is the first one of any size which that comany has received since its recent organization. The mill contract was awarded to the Bethehem Steel Co. The tonnage involved is about 325.

Mechanical Engineers and Accident Prevention*

A Comprehensive Discussion of Safeguarding Life in Manufacturing Plants — Defects of Machinery and Structures

By John Calder

The conservation of our natural resources has rightly received attention from the society, but with one exception, the elements hitherto considered have been of a purely material order. The exception is the valuable and timely monograph on "The Safeguarding of Life in Theaters" which formed the presidential address of John R. Freeman at the annual meeting of 1905.

Yet the preservation, as a national asset, of the lives and limbs of our citizens and industrial workers is more urgent and vital than any steps taken to insure adequate means of subsistence and industry for future generations and an attempt has been made in this paper in a necessarily imperfect way, to treat of the larger field of industrial safeguarding.

Accident clauses, wise and less wise, have been included in the labor laws of the various states for some years, but the provision for administering these laws effectively has always been inadequate. Indeed it would seem as if the earlier legislation of this nature, modeled on the latest practice of the older civilizations, was at the time of its enactment considerably in advance of public sentiment. At least, until quite recently, the subject of prevention of accident has signally failed to obtain really serious consideration from employers and employes in general and most safeguarding progress has been due to official compulsion.

Legal obligation to safeguard thoroughly has not succeeded in preventing avoidable accidents to any great extent except in the relatively few cases where persuasion and enlightenment have accompanied it. On the other hand, civil liability for the consequences of industrial injuries has been steadily increasing and to the necessarily limited efforts of a few state officials, there was added the pressure of insurance underwriters upon employers when accident risks became too onerous.

Employers' Liability.

Employers' liability is receiving at the present time the careful attention of some of our best legal and business minds, but in this paper it is prevention, not cure or compensation, which is emphasized.

The subject of accident prevention, which has by no means been neglected by many careful plant executives, is now coming to the front on that wave of humanitarian consideration which is noticeable everywhere. It is the hope of the writer that mechanical engineers as a professional body will cordially identify themselves with a cause in which they, more than any others, can achieve much good.

On its educational and sentimental aspects the public and press of the east have had their interest awakened to some extent by the efforts of the American Museum of Safety Devices, the National Association of Manufacturers, the National Civic Federation and others. On the strictly practical side the broad-based safeguarding work initiated in all its plants at a large outlay by the United States Steel Corporation has received deserved publicity.

At the same time the successful operation of thorough preventive measures has been going on unnoticed for years at some relatively few individual works, but these have formed quite a minority among the many plants incurring accident risks which were imperfectly safeguarded. It is the object of the present paper to initiate a discussion of accident prevention by stating in some detail the principles of industrial safeguarding as they have presented themselves to the author and illustrating the art freely by examples drawn chiefly from his experience in plant management.

In study and in legislation on this matter we have lagged considerably behind Great Britain, Germany and France, which countries more than 30 years ago began to enforce with strictness and excellent technical judgment, the existing laws for safeguarding industrial workers. In recent visits to mechanical plants in various parts of Europe the author noticed considerable advance over the high standard obtaining there 12 years ago, in protecting the worker from the incidental risks of his employ-

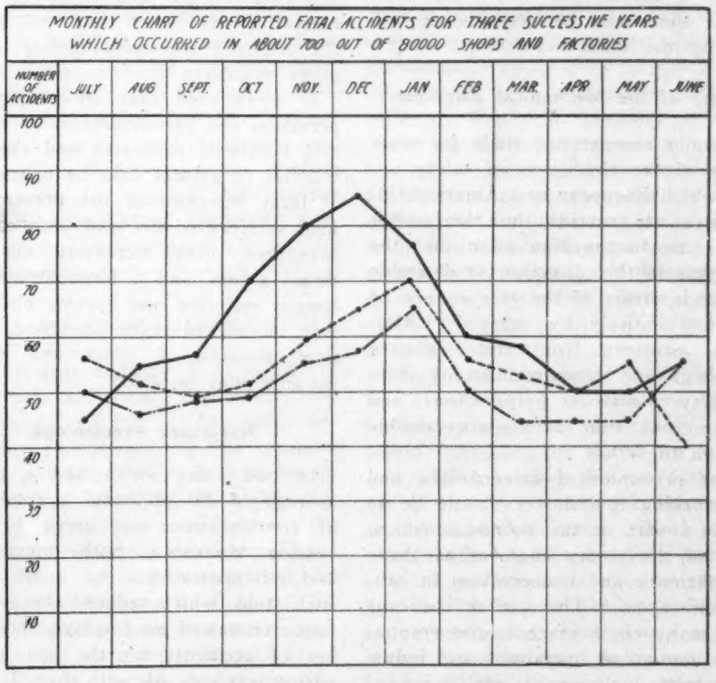


FIG. 1—INFLUENCE OF DAYLIGHT ON ACCIDENT

*From the Journal of the American Society of Mechanical Engineers.

ment and from his own ignorance and carelessness.

Industrial accident reporting is still very incomplete in the United States and the federal government's accident statistics are necessarily below mark; yet Bulletin No. 78 of the Bureau of Labor, September, 1908, states that, among adult wage earners alone, the yearly mortality from accidents is between 30,000 and 35,000. The non-fatal injuries inflicted can not be much less than 2,000,000 additional.

These staggering but undoubtedly conservative figures of a single year of peaceful industry far exceed the killed and wounded of several great military campaigns, and when compared with the more thorough foreign accident returns, give us just cause to inquire why we should be so far behind in conserving the lives and health of the industrial worker. The figures take no account of the many casualties affecting women and young people and they are rarely looked into as a whole; but when the truth about them can be recorded it will stir up the most indifferent.

Duty of the Mechanical Engineer.

From a comparative study for some years of the conditions of safety under which European and American industries are carried on, the author has come to the conclusion that the progress in this direction so desirable in the interests of the race cannot be attained entirely by acts of legislatures, pressure from state officials, warnings and recommendations from casualty insurance corporations and admonitions from sociologists, valuable though these are.

The principles of safeguarding and safeworking in industry should be as much a part of the economic education of the young engineer as those of efficiency and conservation in other directions. The author believes that many engineers enter on responsible control of operations and industries with little or no realization of the employment risks involved. Such a consciousness comes in time, but it is often through the painful and harrowing experience of avoidable accidents and fatalities which were not prevented.

The scientific study as a matter of course and the solution by the mechanical engineer of individual problems of safeguarding, supervision and instruction of employes as they arise in their daily routine will do more than all other existing agencies to bring about satisfactory results. The progress of the art of preventing industrial accident, wherever that is practicable, depends very largely upon the amount of intelligent interest manifested in the subject by members of the profession, whether engaged in plant maintenance, the manufacture of tools and other apparatus, invention of safeguards or in works administration. In such matters as this the attitude and action of the executive is all-important and gives the keynote to the whole plant.

The author wishes to make it clear, however, that all industrial accidents are not considered preventable, either by employer or employe, and that, of those that may be avoided, some do not fall strictly within the engineer's province and a large portion is directly within the control of the injured themselves. Nevertheless, a considerable number of casualties remain which are the most serious in their consequences to operatives and employers alike and which can and ought to be prevented by mechanical and executive precautions and the exercise of the same faculties which the engineer efficiently applies to his other problems.

It is believed that, by proper supervision and precautions in all plants and industrial processes and the cultivation of greater care by operatives, at least one-third of the present annual sacrifice of life and limb can be prevented, thus increasing our national assets, and a large amount of human suffering and sorrow obviated. For this belief there are good practical grounds, of which one typical instance may be cited.

Necessary Precautions.

In one plant which had a yearly average of 200 accidents a good deal of consideration was given to preventive measures, both mechanical and administrative. As a result of such steps, which reduced the earning opportunities of no employe, the number of accidents for the last annual period was only 64, with the following analysis after close inquiry into each case:

In no instance had any accident occurred in a year's time from negligence of the employer and in only one case was the injury contributed to by the negligence of a foreman or responsible overseer. In 25 of the cases the accident was caused solely by the negligence of the person injured and in the remaining 38 cases the occurrence was purely fortuitous, accidental and non-preventable in the most literal sense, no blame being attachable to anyone. The latter evidently represents the unavoidable trade risk of this particular plant. Yet the actual risk, before safeguarding and instruction of employes was seriously undertaken was nearly six times as great and the resultant risk including all cases of carelessness on the part of operatives was less than one-third the original rate. This experience has been repeated in many cases.

The Causes of Accidents.

In illustrating in the present paper what the mechanical engineer may achieve in this department of the conservation movement a definition of *accident* and a review of the chief causes of industrial injuries are in order. The word accident in relation to industry is not specifically defined by any statute, but in the legislation of both the old and the new world it has the popular significance of any unforeseen and usually sudden occurrence which results in bodily injury to any person while present at the work-place or even within the boundaries of the employer's premises.

The injury, to be reportable as an accident, need not arise out of or in connection with the employe's assigned duties. It is the fact of injury, not the cause, which generally makes an accident reportable under the labor laws to the civil authorities. In some cases a time limit of absence from work due to accident has been used by statute to eliminate trivial injuries from reports. It is clear, however, that an employe may be lucky enough to escape with very slight bodily injury from a machine or process properly classed as dangerous and that consideration of the safeguarding of the same should not be overlooked because of that fortunate circumstance.

For this reason the legislative tendency in all countries now is to call for the reporting of every injury without regard to its extent or the incapacity for work entailed. In this way the official investigator and the work's mechanical engineer are both provided immediately with the necessary data regarding the accident, irrespective of its varying consequences.

Analysis of Industrial Accidents.

In analyzing many thousands of industrial accidents, with a view to devising remedies, the author has found the following to be the chief causes: Ignorance, carelessness, unsuitable clothing, insufficient lighting, dirty and obstructed work-places, defects of machinery and structures, and absence

of safeguards. In current popular comment on the wastefulness of life and limb in our industrial regime little regard is paid to the facts underlying accident, but well considered action must be based solely on these, of which some account follows.

Fire, steam generators and other vessels under pressure, electricity, railroads and elevators as contributing factors to accident are omitted from present consideration because they are, of all industrial dangers, those upon which mechanical and other engineers have already lavished attention. It is significant that it is chiefly in cases where property, as well as persons, is liable to injury that preventive measures against accident have as yet been generally and efficiently elaborated.

Ignorance.

In spite of ample facilities now afforded to all for the acquisition of some knowledge of mechanical principles, the author has found some superintendents, a number of foremen, many operatives and not a few managing owners of smaller plants grossly ignorant of the nature of the forces and mechanical arrangement which it is in their power either to control, or to set free with resulting danger to themselves and others.

Illustrations of this will occur at once to all works' executives and it has been to the author a constant matter for regret that organized labor with its unique opportunities has done so little to supplement or complete the mechanical education of its members. Accidents due to the culpable as well as excusable ignorance of supervisors, engineers, millwrights, elevator men, firemen and guardians of general facilities are frequently very serious and nothing but administrative vigilance in selecting and instructing these employes for their own special risks will suffice to prevent such occurrences.

Carelessness.

Sometimes combined with ignorance, sometimes sheer thoughtlessness, folly or horseplay, carelessness by operatives stands highest as a cause of industrial accident from the results of which nothing external can do much to shield the worker and those whom he sometimes involves. All plant executives know that many things workmen do and suffer under this head would hardly be credited by the sympathetic outsider with no knowledge of the facts.

It is the experience of the author that the bright and nervy American workman, so admirable in many respects, is easily first in taking foolish and wholly unnecessary chances with his life and limbs; chances which in no way add to his efficiency or his earnings. The exaggerated ego manifests itself frequently in ostentatious independence full of danger to himself and to others. The maintenance of strict discipline in the shops, the adoption of salutary punitive measures and the firm elimination of the dangerous employe is all that can be done, in addition to a campaign of education throughout the plant.

Accident is caused at many machine parts which are necessarily exposed near the operator and with which he would never come into dangerous contact but for unsuitable or neglected clothing. The ragged sleeve ends, loose ties and open jackets of untidy machinists have again and again been wound upon seemingly trivial parts in motion and through the powerful effect of coil friction have inflicted frightful and often fatal injuries.

Not a few survivors have to thank the inferior strength of the usual overall or dust jacket for escape. The large extent to which females are finding agreeable and profitable employment at light repetition machine work calls for special and obvious precautions regarding dress and general tidiness which need not be detailed here.

Insufficient Lighting.

Insufficient lighting is a cause of numerous accidents, particularly serious and fatal falls. The author has observed that a maximum of accidents occurs towards the close and beginning of each year, that is during November, December and January, the months of minimum daylight. Fig. 1 shows the seasonal distribution for three successive years of about 700 deaths annually from industrial accidents which were reported with other injuries from an area embracing 80,000 plants of varying extents.

The influence of the duration and intensity of natural light in working hours on fatal and serious accidents is particularly noticeable in such founding, bridge building, ship building, engineering, and steel and iron works and other operations as have to be carried on within large spaces, often entirely in the open air and not easily illuminated artificially to the exclusion of deep shadows.

Within plant buildings the intensity of artificial lighting at the cutting point of tools, for instance, and on very limited machine tool or bench areas is frequently far above actual requirements and a source of much physical discomfort, while all around the operative a semi-darkness prevails which has a blinding effect in the sudden transitions of the vision required by his employment.

It has been found by exact photometric observations of shop-lighting conditions both during the day and at night, that the concentrated illumination by means of shades of ordinary 16-candle-power incandescent units on cutting tools in machines and the area near them is often several times the intensity of ordinary daylight on the same parts. It is very difficult to convince the operative that he is suffering from too much light at any place and the call is constantly for more light.

What is wanted from the safety point of view and also, the author believes, from considerations of power economy, is the elimination by good illuminating engineering of this excessive hard light on spots only, which causes eye-strain and poor vision of surrounding areas with resulting accident. A more generally diffused light of less unit intensity is now easily obtained by the use of fewer but larger screened units experimentally located to suit varying shop requirements and reflecting from whitened wall and ceiling surfaces. The mechanical engineer alministering industries or designing plants can do much to reduce the accident risk from this cause.

Dirty and obstructed work places are closely allied to defective illumination as a source of accident. The literal "shedding of light" on waste and rubbish is often the sure fore-runner of their removal and avoidance of accidents, due to them. Work-places often retain unnecessary dirty and obstructed environments causing stumbling and falls and similar accidents, and every management should see to it that the cleaning of floors and passages and the removal of wastes is systematically provided for.

Sometimes this condition is due to the habits of the employe himself and he has to be educated to better ways. At other times floor space is economized and machines and workers are crowded together without due regard to safety in moving about in the confined area. Almost all our mechanical operations can be conducted under pleasanter and safer conditions than at present, so far at least as light and cleanliness are concerned. The tidy shop is less costly in the long run than the dirty one and has

a noticeable effect on the morale of the whole establishment.

Defects of Machinery and Structures.

A good deal of eloquence has been expended, from time to time, on the assumed inherent and deadly defects in machinery and structures used in the arts. These indeed contribute to some serious and a number of minor casualties, but to nothing like the extent commonly alleged. Altogether, apart from the question of specific safeguarding provisions, it has been infrequent in the author's experience to find machines or processes in operation which are essentially dangerous because of defective design or arrangement, or from lack of repairs or renewals, and thereby liable to break down and cause injury.

It certainly does not pay any employer to keep a defective tool in operation; nor is it in the interest of the employe, particularly if he is paid by the task, to use imperfect apparatus which reduces his possible earnings. On the other hand, it is by no means infrequent to find workmen, who have their choice of the best materials and apparatus and who possess the intelligence to apply these correctly, showing a striking disregard for their own safety and that of others, especially in framing structures and arrangements of a temporary nature.

This is particularly the case in outside work and especially in the building trades, but standardized methods are gradually taking away the workman's initiative in this matter. Workmen persisting in practices of this nature should be eliminated as unfit and dangerous employes and the ability of any untried operative to construct safe facilities to be used by himself and others should never be taken on trust.

Overloaded machines and structures, decayed gangways, worn out floors and stair treads, unannealed chains and hooks, frayed and stranded ropes and tackle and a host of minor industrial equipment are items which should pass under systematic and intelligent review from time to time as possible sources of accident.

These, it may be said, are commonplaces, but they are also common neglects both on the part of executives and of workmen themselves. Such attention to safety need be no burden. In the daily routine of plants, whether large or small, if machinery and other equipment is properly selected and installed, and hurry calls for repairs promptly responded to by competent people, and the employers made to feel that suggestions as to real or even imagined defects in the apparatus they must use are welcomed, the team work of good organization will help greatly to eliminate avoidable accidents from these causes, which are usually a reflection upon the executives.

The absence of safeguards, though not the most prolific cause of accident in plants, closely concerns the mechanical engineer who holds the possibilities largely in his own hands. In the eyes of the public and non-technical investigators it is of first importance. Though our industrial life is characterized by a steady extension of the factory system of production and an increased division of labor using mechanical aids, the accident list need not increase pro-rata.

Absence of Safeguards.

In many cases of injuries to operatives caused by the absence of a possible safeguard it will be found that it has been removed, or rendered ineffective by the employe for lack of supervision in such matters or that protection has never been provided. Safeguarding absent at one machine is sometimes actually afforded elsewhere under the same roof and the accident is due to the operation of the principle, that what is permitted to be everybody's or anybody's business is in daily life nobody's business. The safety engineering of no plant should be left to the haphazard initiative of a number of individuals.

Consideration of what the mechanical engineer can contribute to this end naturally falls into two divisions:

a The efficient safeguarding which he may design as an integral part of the machine tools and other apparatus supplied by him for use in the arts.

b The safeguarding which he may later devise and supply as the mechanical engineer or executive of plants using power apparatus and other equipment capable of inflicting injury as installed and which cannot be intelligently protected until all related apparatus is in position and the operating conditions for employes fully apparent.

Some degree of finality is necessarily attainable in the simpler forms of safeguards about power houses, transmission machinery and dangerous details common to all machines, and most failures to prevent accidents from these are due to lack of consistency and thoroughness in applying the recognized remedies. The safeguarding of some especially dangerous machines and processes is to some extent evolutionary and where it is legally obligatory it must be of the safest type known. So far as statutory compulsion in any one state is concerned, the requirement to safeguard the more powerful machine parts is usually absolute. In the much larger field of machine operations in detail, it is conditioned by proof of danger and necessarily by practicability.

(To be continued.)

Carnegie Relief Fund

The ninth annual report of the Carnegie Relief Fund, founded in January, 1902, by Andrew Carnegie, shows that in 1910 the employes of the several concerns received in accident benefits, $17,777; in death benefits, $92,496.25, and in pension allowances, $106,596.35, a grand total of $216,869.60. Benefits paid to employes of the Carnegie Steel Co., were $8,422.50 for accidents, $39,665.25 for deaths, and $66,847.60 in pensions. The employes of the H. C. Frick Coke Co. received in pensions $30,479.90; $24,986 in death benefits and $3,636.75 in accident benefits. The Oliver Iron Mining Co. participated to the extent of $1,395 for accidents; $2,585 for deaths and $557.70 in pensions, while employes of the Marquette range received $365 in accident benefits; $3,768 for deaths and $1,591.45 in pensions; Menominee range, $730 in accident benefits and $1,040 in death benefits; Mesabi range $951.75 in accident benefits and $4,405 in death benefits; Vermilion range $766 in accident benefits and $2,632 in death benefits; Bessemer & Lake Erie Railroad Co., $285 in accidents, $5,880 for deaths and $1,073.10 in pensions; Union Railroad Co., $365 for accidents, $3,155 for deaths and $103.20 in pensions; Pittsburg Steamship Co., $810 for deaths; Pittsburg & Connellsville Dock Co., $495 for accidents and $880 for deaths; National Mining Co., $365 for accidents and $500 for deaths; Mahoning Limestone Co., $420 for deaths; Carnegie Land Co., $240 for deaths; Hostetter Connellsville Coke Co., $390 for deaths, and Keystone Bridge Works, $5,943.40 in pensions.

The total benefits disbursed by the fund since its inception, are: Accident benefits, $443,391.19; death benefits, $782,043.75, and in pensions, $531,520.65, a grand total of $1,765,955.59.

An initial order for ten portable electric drilling machines to be used in structural steel plants, bridge, steel car, boiler and engine works, has been completed by the Pennsylvania Casting & Machine Co., Pittsburg. The drills were designed and built under direction of James A. Bradley, to operate at 220 volts.

A Model Pacific Coast Manufacturing Plant

Shops of the Vulcan Iron Works, Seattle, Which Compare Favorably With the Most Modern Factories of the East

From the nature of the material dealt with, the working of iron and steel has come to be looked upon as a somewhat grimy occupation. The suggestion of a foundry or machine shop brings to the popular imagination a sweaty, sooty, smelly place, darkened by smoke and full of bustle and noise.

The accompanying illustrations, however, show that in even the newest sections of the country neatness, light and cheerful surroundings mark the modern industrial plant and that the Pacific slope is not, by any means, backward in this respect. In no plant in the country has the value of these features been more fully demonstrated than at the Vulcan Iron Works, Seattle, where a unique plant has been built on the reclaimed tide flats to the south of the city.

The Vulcan Iron Works was not built piecemeal, but is the result of a carefully made plan which was worked out in full before a pile was driven for any part of the foundations from which it rises. Economy of original outlay was apparently the first consideration. The thought was to create an institution with the best modern equipment for the saving of time and labor and with extraordinary regard for the comfort and well-being of the employes. In addition to the cost of the 12-acre site the building of the works entailed an expenditure of about $2,000,000.

The plant was designed by, and constructed under the personal supervision of H. P. Strickland, its president and general manager. The site is located so that over its own spur tracks the plant has direct communication with six trans-continental railroads as well as waterfront facilities. The entire enclosure is substantially planked and the buildings, 13 in number, so grouped as to facilitate intercommunication and yet present an agreeable appearance. The opinion of many who have visited the plant is that for scientific and economical operation and for the comfort of its men, the Vulcan works, while not among the large plants as they are now measured, has few equals.

The first impression gained, and one that predominates throughout a visit, is of the cleanliness and order apparent on every side. The planked thoroughfares between the buildings are perfectly clean; there is no sign of debris and on every hand is the evidence of unceasing care. One feature which distinguishes the Vulcan works among metal working concerns and which is the company's most valuable aid in the campaign for cleanliness and order, is the floral display. From beds of cultivated soil around the base of every building spring vines, shrubs and flowering plants of every description. The mildness of the Puget Sound winters makes most of this display perennial. In a large conservatory are pots and boxes of bulbs and slips which in early spring will be added to the fringe of plants already in place about the buildings. This conservatory is accessible to all employes and often visited by them. In addition to the display of tropical plants which are nurtured by artificial heat are a score or more of canaries, lively, musical and at liberty.

Opposite the conservatory is a large

FIG. 1—VIEW OF ONE SECTION OF THE VULCAN IRON WORKS ERECTING SHOP

FIG. 2—THE CONSERVATORY IN WHICH ARE GROWN FLOWERS AND SHRUBBERY FOR THE ADORNMENT OF THE VARIOUS BUILDINGS OF THE VULCAN IRON WORKS.

FIG. 3—A SECTION OF ONE OF THE MODERN WASH ROOMS FOR THE EMPLOYES.

FIG. 4—GENERAL VIEW OF THE VULCAN IRON WORKS

FIG. 5—FLOWERS AND CASTINGS SEEM TO GO HAND-IN-HAND IN THIS MODEL PLANT.

FIG. 6—INTERIOR VIEW OF THE CONSERVATORY.

building devoted wholly to the use of the employes and designed especially for their convenience. In front is the office of the timekeeper and the remainder of the ground floor is given over to extensive lavatories and a comfort station. Half the upper floor is filled with lockers, one for each man, where working clothes are exchanged for street garments and the other half is used as a reading and lecture room, where may be found all the best publications of a technical and educational character. At intervals lectures are given which apprentices must attend, and old employes have the privilege of listening to.

struction of the largest building yet undertaken in Seattle. The logging engines and mill machinery produced by the works are recognized as standard and are extensively used in the lumber industry of the northwest.

The Plant.

The plant consists of 13 buildings, the office, comfort station, structural steel shop, machine shop, foundry, forge shop, pattern shop, stock rooms, pipe shop, garage and transformer station. The buildings are of uniform style, two stories high, built of concrete, corrugated sheet steel, ribbed glass and wood, and are painted light gray. The

ping office and store room. The conservatory adds a finishing touch to the homelike appearance of the offices and is located on the ground floor. The comfort station in the rear of the office is 20 x 100 feet and the wash room contains 96 lavatories, each fitted with hot and cold water basin cocks, 17 siphon jet closets and three porcelain slop sinks. On the second floor are 250 wood lockers.

Structural Steel Shop.

The structural steel shop is 64 x 260 feet with the roof carried on trusses, of which the lower chords are spliced timbers with 14-foot centers.

FIG. 7—A VIEW OF ONE SECTION OF THE FOUNDRY OPERATED BY THE VULCAN IRON WORKS

Every encouragement is given for advancement in this line, and by such means the company has successfully enlisted the sympathy and co-operation of its employes.

Two contracts received by the company recently are worthy of special note by reason of their being the first of their kind ever placed in the Pacific northwest. The first was for the construction of seven large stamp mills, of five stamps each, for the Seattle-Alaska Copper Co.'s properties on La Touche island. The second, on which work has just begun, is for the fabrication of the structural steel which will enter into the con-

walls of the upper story are of glass and distribute the light uniformly. The attention bestowed on the lighting in particular is shown by the illustration.

The office occupies a ground space of 20 x 150 feet. The second floor is given over to the general offices, draughting rooms, private offices and a small kitchen and lunch room used by the executive force. The general offices are finished in golden oak with windows well distributed along the entire length. The private offices are separated from the main office by an art glass partition, finished in mahogany. The ground floor of the office building is devoted to the local ship-

The steel stock rooms are each 52 x 160 feet, the pipe shop being in the corner of one room. A stock of over 10,000 tons of steel is kept on hand at all times. The machine shop occupies a ground space of 90 x 150 feet and has a second floor covering one-third of the lower floor space and on which are placed the lighter tools. The foundry is in line with the machine shop and is 90 x 150 feet with one side open to the spur tracks, where the sand, coke and pig iron are unloaded direct to the bins. Each bin has a capacity of between five and six carloads and the material is lifted from the bins to the charging floor by an

FIG. 8—SECTION OF THE LOCKER ROOM; EVERY EMPLOYE HAS HIS PRIVATE LOCKER

electric elevator. The forge shop and bolt room are housed in one building, 60 x 150 feet. The pattern shop is 60 x 100 feet and contains both the woodworking machinery and the pattern storage room. This storage room is divided into sections, each with a system of shelves and a card index which gives the number of the shelf, section and location of each pattern.

The garage is a three-story, 40 x 60 feet, concrete construction building. Two floors are fitted up with living rooms and for storage purposes and the third floor is a modern garage in every sense of the word. The company's auto equipment consists of two trucks, 3½ and 5 tons in capacity, and another of 1,000 pounds, also a runabout.

The transformer station is 15 x 15 feet, built of reinforced concrete. The power used by the plant is taken from the city lines at 2,200 volts and stepped down to 220 for use in the motors and in the lighting system.

FIG. 9—A CORNER OF THE FLASK YARD, SHOWING TRANSPORTATION FACILITIES FOR HANDLING RAW MATERIALS, FLASKS, ETC. THE NEATNESS OF THIS YARD IS IN STRIKING CONTRAST TO THE DISORDER PREVALENT IN THE AVERAGE FOUNDRY STORAGE YARD

Machine Shop.

In the machine shop the heavy machines are all direct-connected to 220-volt, 60-cycle alternating current motors ranging from 5 to 30-horsepower. The tools include one 30-inch x 38-foot 6 inch Niles shafting lathe, one 28-inch Pond rigid turret lathe, one 76-inch Pond radial drill, one Niles 84-inch x 12-foot hydraulic press, one 36-inch Pond heavy duty planer with three heads, 44-inch and 84-inch Niles boring mills, 38-inch and 32-inch Bickford radial drills, 60-inch Henley pulley lathe and one 48 x 48-inch by 12-foot Dietrich & Harvey open side planer with three heads. The lighter machines are equally divided between the floor and the gallery, each set being belt-driven by a 50-horsepower General Electric motor. These consist of a 24-inch Gisholt turret lathe, 20-inch Gould & Eberhardt high-duty shaper, 20-inch Baker Bros. keyseater, 30 x 30-inch x 8-foot Cincinnati planer, No. 4½ Burr shaft key seater, 36-inch

American radial drill, 38-inch x 14-foot Putman lathe, 20-inch Cincinnati back-geared shaper, 24-inch x 24-foot Lodge & Shipley high speed lathe, 20-inch Barnes upright drill, 18-inch x 46-inch Greenerd arbor press, 18-inch x 8-foot New Haven engine lathe, 14-inch x 40-inch Hendey engine lathe, 18-inch x 6-foot Schumacher & Boye engine lathe, 2-inch Jones & Lamson turret lathe, 2-inch Pratt & Whitney turret lathe, 20 and 26-inch, Barnes upright drills, six Lodge & Shipley patent head engine lathes, three 20-inch x 10-foot and three 18-inch x 12-foot. Each machine has a small traveling crane or a jib crane so placed that it is possible to set any piece of work in the machine. A 15-ton Pawling & Harnischfeger electric traveling crane runs the entire length of the shop.

The tool room is complete in every detail and contains a No. 2 Cincinnati milling machine, 24-inch Cincinnati upright drill press with geared tapping attachment, 16-inch x 8-foot Pratt & Whitney tool-room lathe, with draw-in collet chucks, etc., Cincinnati cutter and reamer grinder, sensitive drill and a large assortment of small tools.

Bolt Shop.

In the bolt shop are two 6-spindle, 1½-inch Acme nut tappers, two 3-spindle Acme 1½-inch bolt cutters, 1-inch Acme bolt pointer, 20-inch Barnes upright drill, 24-inch Barnes drill, 3½-inch Acme bolt cutter, 3½-inch National bolt cutter, Williams & White bolt bender, 1-inch Acme bolt header and one 3½-inch Acme forging machine. The latter machine weighs 84,000 pounds and is one of the largest made. Two oil furances are placed near the headers.

The forge shop is equipped with four Niles-Bement-Pond steam hammers, 350, 800, 1,500 and 4,000 pounds, respectively, and six jib cranes. An interesting feature of the forge room is the manner of placing the oil furnace with regard to the boiler which furnishes steam for the hammers and for heat. The boiler is of 150 horsepower capacity, of the Scotch marine type fitted for oil fuel. The oil furnace, which is large enough to heat an ingot 18 inches square, is placed at one end of the boiler and the hot gases are made to pass directly into, and through, the boiler, thus supplying the heat required for steam-making and economizing fuel, which is thus made to do double work.

Equipment of Structural Shop.

The structural steel shop contains one Barnes 26-inch upright drill, 48-inch x 30-foot double head column facing lathe, direct-connected to a General Electric motor, 20-inch Williams & White double punch press with a 7½-horsepower motor, 36-inch Cleveland punch press with a 7½-horsepower motor, Ryerson 4-foot high speed friction saw with a 52-horsepower motor, Higley cold sawing machine with a 10-horsepower motor and a 20-ton Whiting traveling crane which is arranged to load directly onto cars on the siding. More new equipment has been ordered for this shop and shortly there will be installed one 419 cubic foot Franklin motor-driven air compressor; six Albree yoke riveters; a number of Boyer riveting hammers and Little Giant air drills; portable air compressor plant for bridge and structural work; 38-inch heavy duty beam punching and coping machine; 48-inch heavy duty gate shear for 1⅛-inch plates; 74-inch heavy duty plate straightening rolls; 74-inch heavy duty plate bending rolls; No. 4 heavy duty beam bending and straightening machine; two 14-foot radial drills and two 10-ton, 20-foot span electric cranes.

The foundry equipment consists of three cupolas 76, 60 and 48-inch, respectively. The core oven is 12 x 19 feet and the core car 10 x 17 feet.

In the pipe shop are four Bignall & Keeler pipe threading machines taking from ½ to 12-inch pipe, each driven by a Westinghouse motor. From each store room a 15-ton Pawling & Harnischfeger traveling crane runs direct to the cars and sidings.

The heating and sanitary equipment of the plant is most modern. Steam is taken from the boiler at 150 pounds pressure and reduced to a pressure of about 5 pounds. The piping for the heating system is placed under the floors. By means of an underground system the waste water around the plant is collected at a central station and pumped to a sewer by a 3-inch centrifugal pump. A gravity system is used for fire protection and each building is equipped with stand pipes and hose racks.

Tentative Specifications for Iron Ore Briquettes

By A. E. White

Probably no question at the present time, relative to the treatment of fine ores and flue dust, has received greater consideration than the proper method of sintering, clinkering or briquetting of the ores. It is a question of vital interest to all blast furnace operators, although there is at present considerable disagreement among the different managers of blast furnaces as to the influence which agglomerating of fine ores will accomplish.

In looking over this field, I have come in contact with many means and ways which have already been devised for carrying out the successful sintering of fine ores. I have endeavored to find some means of properly testing the agglomerated product for the purpose of arriving at some definite opinion as to its real worth. I have found certain portions of methods for carrying out the test, but in no place have I come across a brief, concise and full statement relative to this matter.

In consequence I am taking the liberty of submitting tentative test specifications for the testing of sinter, clinker, nodulized, or briquetted iron ore or flue dust. I do not say that these tests are perfect, but it does seem to me that if a product can be shown to stand up under these specifications that it will prove to be a very desirable ore. I likewise feel that a presentation of these specifications may possibly call for some discussion with regard to them, with the resulting consequences that desirable specifications may be brought down to a working basis in a very short time.

Tentative Specifications.

The specifications are as follows:

Tests Required.

The products shall be subjected to the following tests: Absorption, abrasion, heat-resistance, water resistance, steam resistance and compression.

Selection of Samples.

For the purpose of the tests at least 25 samples representing the ordinary commercial product shall be provided. Each sample or portions of the separate particles making a respective sample shall in all cases weigh at least 5 pounds.

Absorption Test.

Five samples shall be selected and thoroughly dried to a constant dry state in an

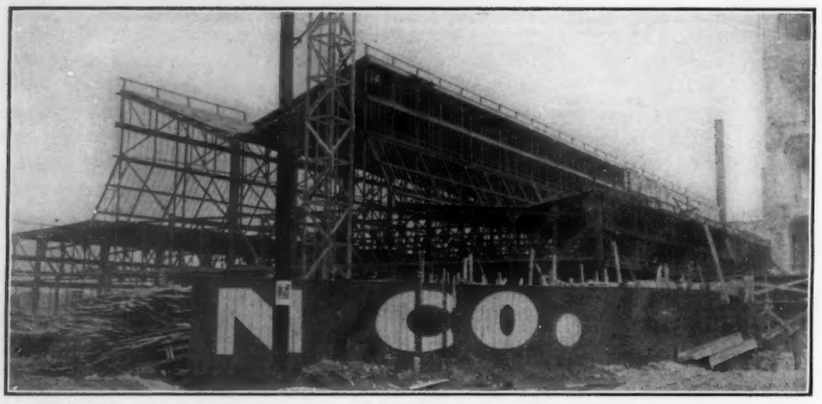


FIG. 1—END AND SIDE VIEW OF DEERE & CO.'S FORGE SHOP, MOLINE, ILL., SHOWING DOUBLE MONITOR CONSTRUCTION.

atmosphere of 250 degrees Fahr. and their weight carefully recorded. Samples shall then be immersed in water to a depth of 1 foot, and their weights taken at the following periods from the time of their immersion: ½ hour, ¾ hour, 1 hour, 2 hours, 3 hours, 4 hours, 5 hours, 6 hours, 12 hours, 24 hours, 36 hours, and 48 hours.

The data thus obtained shall be plotted in a curve showing observation versus time, and the shape of this curve shall be considered in estimating the quality of these briquettes. Should a briquette fail to reach its maximum absorptive power in less than two hours it shall be rejected. Likewise, if the briquettes fail to have less than 20 per cent porosity, they should be rejected.

Note:—Superfluous moisture to be removed by careful wiping with a damp cotton cloth before each weighing.

DROP TEST.

Five samples shall be selected and dropped *en masse* from a height of 10 feet onto a cast iron plate. The entire material shall then be picked up and the operation repeated. This operation shall continue until the briquettes have been dropped 10 times.

A sieve test shall then be made on the broken briquettes and it shall be required that not over 25 per cent of them shall have been so broken as to pass through 40 mesh.

HEAT RESISTANCE.

Five samples shall be selected and subjected to 900 degrees Cent. of heat for a period of one hour. Two hours shall be required as a minimum to bring the briquettes up to the required heat; with such treatment as this the briquettes may begin to sinter, but they must not disintegrate into small pieces. At the conclusion of this test the briquettes shall be subjected to abrasion and compression tests and failure to stand up under these tests shall be cause for the rejection of the briquettes.

COMPRESSION TEST.

Five samples shall be subjected to compression. It shall be required that each briquette shall withstand a pressure of at least 1,000 pounds per square inch.

Note:—Samples having a rough and uneven surface shall be made even by a thin layer of plaster of paris.

WATER RESISTANCE.

Five samples shall be selected and immersed in water for a period of 48 hours; at the conclusion of this time no indication of softening shall be manifested.

If such should prove to be the case they should be subjected, on coming out of the water, to a compression and abrasion test, and they should comply with the requirements, although in a water-soaked condition.

STEAM RESISTANCE.

Five samples shall be taken and subjected to the influence of steam heat at 150 degrees Cent. for a period of 12 hours. At the conclusion of this treatment no crumbling shall be manifested. If there is any indication that such should prove the case, it shall then be required that they shall pass a compression and abrasion test.

Lighting and Ventilating Factories

A double monitor on an extremely wide building in place of two ordinary monitors is the new type of roof construction recently designed by Clark P. Pond, of David Lupton's Sons Co., Philadelphia. It is the result of ideas gathered in Europe and elsewhere, on a trip from which Mr.

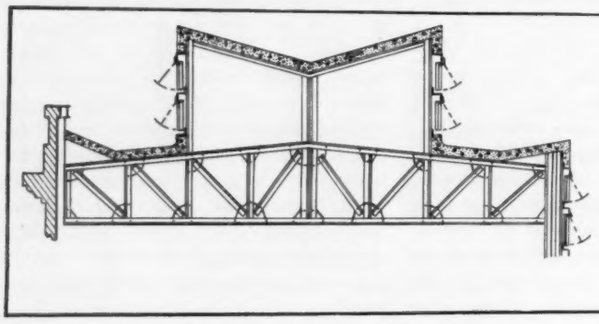


FIG. 2—CROSS-SECTION OF ROOF, SHOWING DOUBLE MONITOR CONSTRUCTION.

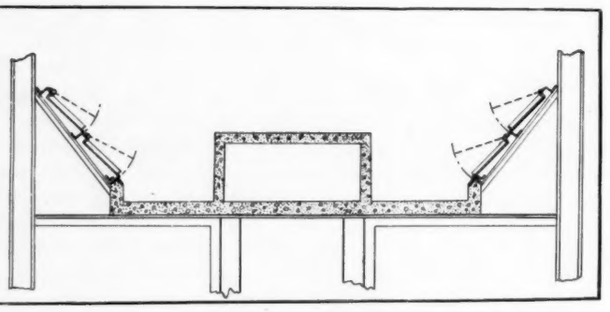


FIG. 3—CROSS-SECTION OF ROOF OF BOILER HOUSE IN COURSE OF CONSTRUCTION FOR THE CLEVELAND ELECTRIC ILLUMINATING CO.

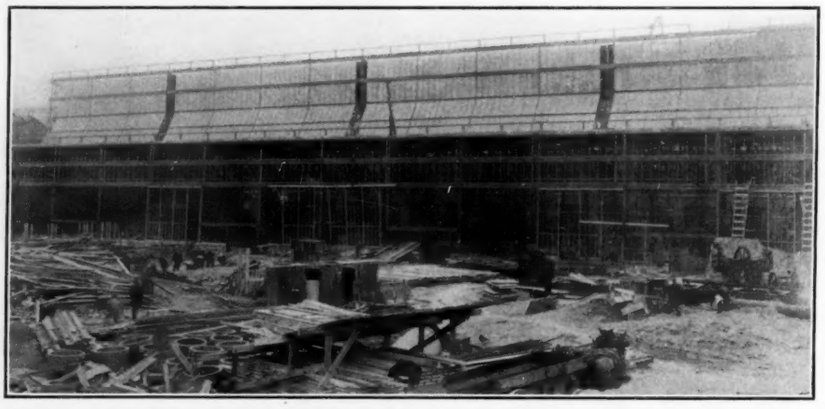


FIG. 4—SIDE VIEW OF DEERE & CO.'S FORGE SHOP, MOLINE, ILL., SHOWING CONTINUOUS SASH USED IN DOUBLE MONITOR AND UPPER SIDE WALLS, AND COUNTER-BALANCED SASH BELOW.

Pond recently returned. The idea is now being incorporated in a large, new power house which the Cleveland Electric Illuminating Co., Cleveland, is erecting in that city, in the forge shop being built by Deere & Co., Moline, Ill., and in the buildings of the General Electric Co.'s new plant at Erie, Pa.

The double monitor shown in Fig. 1 and in cross-section in Fig. 2, is used to best advantage in buildings about 150 feet in width. In such structures, it is claimed that the double monitor effects a saving in the cost of construction of 25 per cent. In buildings of lesser width, while the design is not impracticable, the savings that can be effected are much smaller. Its distinguishing feature is that instead of having an "A" roof as is ordinarily the case, the new method provides for a "V" roof. Thus the drainage gutter is at the bottom of the "V" and so constructed that one-half of the drainage will flow to either end of the building. The other result of the "V" formation of the roof is that much higher sides are thus made possible for the monitor. The double monitor, for this reason, will admit as much light and ventilation as would be possible with two ordinary monitors.

This style of monitor is supported on Pond roof trusses, which require no columns to obstruct the space in the building. At each end of the building the only central columns are located, and these run up to the base of the gutter. The drain-pipes run down at the side of each of these columns.

The power plant of the Cleveland Electric Illuminating Co. is to consist of two, 130 x 300-foot buildings, each of which is to be furnished with the new double monitor.

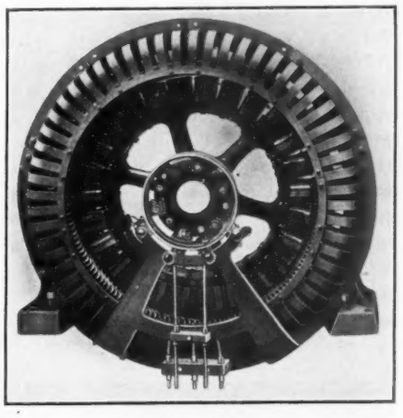
Deere & Co.'s forge shop at Moline, Ill., is a 150 x 850-foot structure and is now nearing completion, and will be practically an all-steel and glass building. The monitor and the upper side walls are furnished with Pond continuous sash and operating device. Below the continuous sash, in the side walls, Lupton steel counter-balanced sash is used. By the aid of the continuous sash, both sides of the double monitor, as well as the upper side walls, may be opened when desired, thus permitting of any degree of ventilation.

Mr. Pond has also recently designed a new method of boiler room construction; its object is the elimination of gas and smoke from the plant, as well as to prevent the draft from coming into direct contact with and chilling the boilers.

The principle is embodied in the new plant of the Cleveland Electric Illuminating Co., and is shown in cross-section in Fig. 3. The boiler room is located between the two main buildings of the plant, hence it is at the bottom of what may be called a light well. The roof of the boiler room, which is not of unusual height, thus stretches from the outer wall of one building to the outer wall of the other. The draft to the fires is arranged for by means of windows which are placed in the roof along both sides and open in such a manner as to exclude snow and rain. By means of continuous sash and operating device the desired amount of draft may be easily obtained.

Westinghouse Engine Type Generators

The Westinghouse Electric & Mfg. Co., Pittsburg, has recently placed on the market a line of low speed, 60-cycle, engine type alternators embodying a number of new features of design. The line includes capacities from 50 to 1,100 kilowatt volt amperes, 2 or 3-phase, and standard voltages of 240, 480, 600, 1,200 and 2,400 volts.



VIEW OF COLLECTOR END OF WESTINGHOUSE ENGINE TYPE GENERATOR.

The stator frames are designed so as to give great rigidity and plenty of freedom for the end connections of the armature winding and are at the same time economical of material and afford excellent ventilation. The frame consists of a one-piece casting, except in such sizes where a split frame is a necessity for shipping reasons. The smaller sizes are provided with slide rails on which the frame can be shifted to expose the rotor.

The armature core is built of japanned steel laminations of good magnetic characteristics, dove-tailed in recesses in the frame and assembled under pressure and securely held by finger and end plates.

Because of the design repairs to the armature winding are easily made. The armature slots are open and the coils held in place by wedges. The coils are entirely interchangeable and are completely formed and insulated before assembling in the core.

The bells, provided for the protection of the armature winding and attached to the ends of the frame, are of segments bolted together so that they are light and open, yet rigid and indestructible.

The brush holder brackets, except in the larger sizes, are bolted to the armature frame, which makes each generator complete in itself. On the larger sizes, they are mounted on a pedestal bolted to the engine bed plate. At least two brushes are provided for each collector ring, so that any brush may be adjusted without opening the field circuit.

The rotor consists of a casting with laminated pole pieces bolted on. The proportions of the casting are worked out with special reference to cooling strains, and the material used provides a homogeneous magnetic circuit. Edgewise wound strap is used for the field coils, making an ideal construction as every turn of winding is exposed to the air and heat is readily dissipated. The insulation between turns is of fireproof quality.

The field poles are so designed that a cage damper winding may be used when desired. Such a winding consists of a series of copper bars embedded in the pole faces, with the ends short-circuited like the squirrel cage winding of an induction motor. The winding serves as a damper to any fluctuation and thus tends to prevent "hunting." The cage damper winding is not essential to satisfactory operation, when modern steam engines are used as the prime movers, but is advisable where internal combustion engines are used.

The collectors are of the spider type, consisting of two machined cast iron rings mounted on a cast iron bushing or hub, from which they are carefully insulated. The hub is bolted to the rotor spider casting, so that the alignment is entirely independent of shaft adjustments.

An ample factor of safety has been allowed throughout and the design is such that overloads and low power factors do not interfere with satisfactory service.

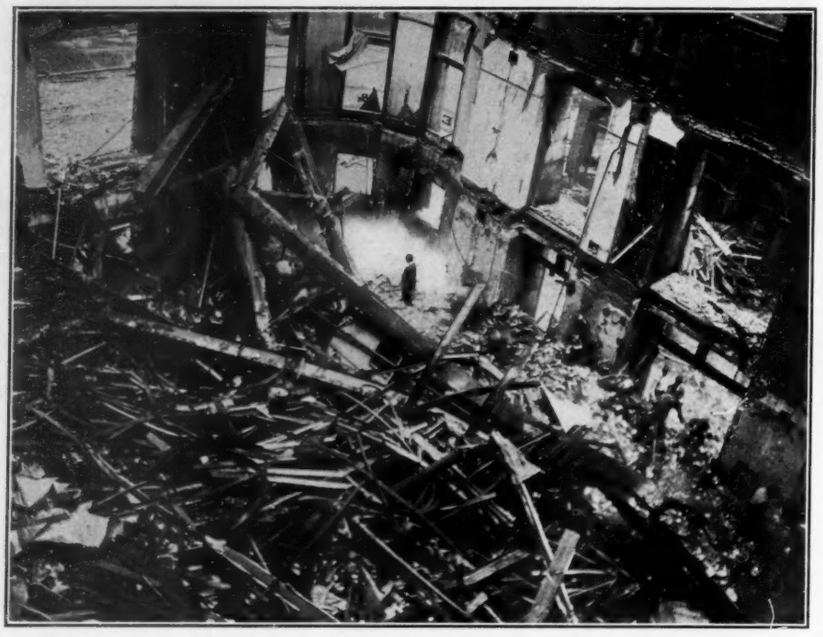


FIG. 1—CINCINNATI CHAMBER OF COMMERCE BUILDING WHICH WAS WRECKED BY FIRE. THIS VIEW SHOWS THE SOUTH WALL STRIPPED CLEAN BY FALLING TRUSSES FROM THE SEVENTH FLOOR.

Defects of Accepted Fireproof Construction

In the fire that gutted the Chamber of Commerce building, Cincinnati, on Jan. 10, lies the basis for more than one moral that may be applied with profit to the construction of fireproof buildings. Before the fire, when the building was a splendid monument of stone, and after the fire, with the stone walls still standing, architects and builders generally agreed the building was as fireproof as it was possible to make it. Nevertheless, the building was wrecked and six men lost their lives, in the incredible short time of one hour.

The destruction develops the fact that some of the steel used in the construction of the framework of the building was not fireproofed. The construction of the interior of the building was somewhat exceptional and peculiar. Above the first floor was a great hall, 150 feet in length by 70 feet in width and 50 feet in height, called the "Change," and used by the Chamber of Commerce as its assembly hall for purposes pertaining to its activity. In building, it was decided to have this room entirely free of any supports or obstructions. The side walls on the long side of the hall were made very heavy bearing walls, topped with iron plates forming foundations for the ends of the steel trusses that supported the roof. The three upper floors, the fifth, sixth and seventh, office floors of the building, were hung from these steel roof trusses.

The roof was an immense affair, extending about 75 feet above the top of the side walls. The steel and rafter trusses were linked with purlins, to which the slate roof was tied with copper wire. Below the roof was an attic, the floor of which formed the ceiling of the seventh floor, built of steel girders, lined with hollow tile and covered with a covering of concrete, making it absolutely fireproof. In this attic were placed a tank for supplying hydrostatic pressure to the elevators, motors and ventilating equipment.

The rafter trusses, 75 feet long and spaced at equal distances apart, projected 8 to 10 feet into the interior of the attic, making it almost impossible to satisfactorily fireproof them. The three upper floors were suspended from these trusses and were of fireproof construction built with tile floors and steel beams. The two lower floors rested on a masonry foundation and steel beams. The construction below the hall was independent of the upper floors, with all floors and girders of steel filled in with hollow tile.

The fire which caused the ruin, started on the seventh floor in a kitchen and rapidly extended upward into the attic, where it was fed by the accumulation of stored goods. When the heat of the flames became sufficiently intense to soften and weaken the unprotected steel roof trusses, those in the south end yielded and the three hung floors gave way in that end. The weight of those floors falling crushed the floors below at that end, supported from the ground, and carried every part to the ground, as shown in Fig. 1. The granite walls of the building remain in position, uninjured. From the top of the granite walls, in line with the other floor level, the roof rose 75 feet, supported by steel trusses. The building as built was as nearly fireproof as any in Cincinnati, and a fire anywhere below the attic would probably have been extinguished without serious injury.

As a chain has its weakest link, so the unprotected steel trusses exposed

(Continued on page 324.)

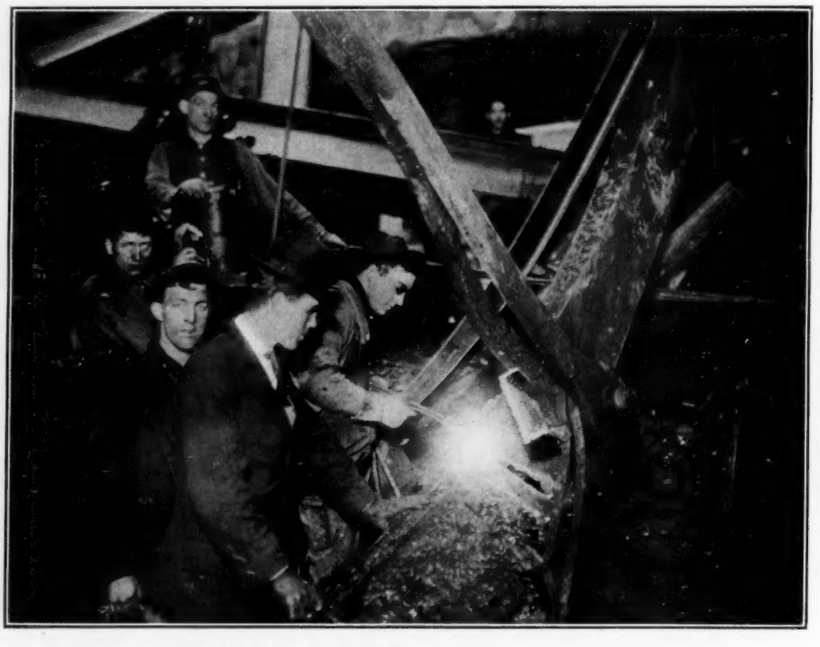


FIG. 2—CUTTING THE WRECKED STEEL TRUSSES IN THE BASEMENT OF THE CHAMBER OF COMMERCE BUILDING WITH AN OXY-ACETYLENE TORCH

Equipping an Automobile Shop with Motor Drive

A New Alternating Current System in the Motor Car Factory of the Willys-Overland Co., Toledo, O.

*By W. A. Hill**

In many machine shops where the group system of electric drive is used, it is often found advisable after the shop has been in operation for some time, to re-arrange the motors to meet changed conditions or to substitute for direct current machines more modern and efficient alternating current apparatus. In order to effect economies, these changes must be made with the individual conditions of operation carefully kept in mind and without going to too great expense in changing motors, shafts, belts, etc., and in moving heavy machine tools. A good example of a change in electric drive from direct to alternating current, resulting in improved conditions, is found in the plant of the Willys-Overland Co., manufacturer of automobiles, Toledo, O. Early in the summer of 1909 this company took over the plant of the Pope Motor Car Co., at Toledo. The generating equipment then consisted of two 100-kilowatt, 550-volt, direct-connected, belted generators for power, and four 25-kilowatt, 110-volt, direct-connected, bi - polar generators for lighting. The machinery was group-driven with motors ranging in size from 1 to 50 horsepower, the total connected load being about 650 horsepower. In most cases the motors were mounted on the floor in a corner of the room. In some instances, however, one motor was used to drive three floors.

Auxiliary power was purchased from the local traction company for both lighting and motors. Since the purchased power for motors was from trolley circuit with its attendant fluctuations, and since the number of buildings in the plant was to be tripled and the amount of power required increased proportionately, it was deemed advisable to either install an alternating current generating equipment or to purchase power of this character. Owing to the necessity of building automobiles for the season, which was already advanced, the installation of the necessary generating equipment was out of the question. This left but one avenue for securing the desired power. It was, therefore, decided to use central station power, as this could be procured in a short time, and the cost per kilowatt hour would probably be no more than that of an isolated plant.

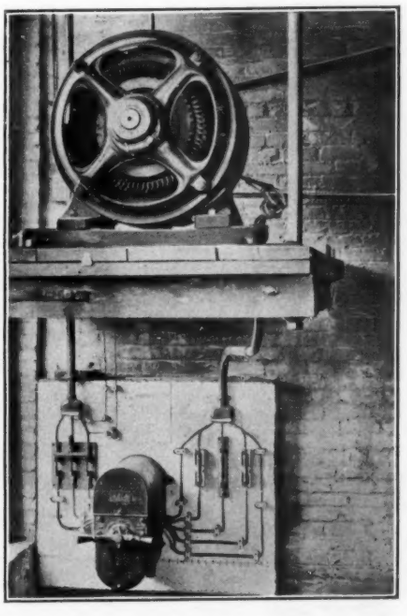
*Chief Electrician, Willys-Overland Co.

Transformer Room.

Three-phase, 25-cycle current at a pressure of 4,000 volts is transmitted to the plant from the central station, situated about three miles distant. The high tension feeders are brought over the property on poles to the transformer station, located at the center of distribution. After entering the transformer room the current passes through a 300-ampere, 6,000-volt, 3-phase, automatic overload oil switch. Six single phase transformers, three 200-kilowatt and three 100-kilowatt, are used to step down the current from 4,000 to 440 volts, at which tension it is transmitted to the motors throughout the shop. The main switchboard is located in the same room with the transformers. It consists of two main control panels and four feeder panels.

Elevator Motors.

There are six elevators in the plant, each with a capacity of 4,000 pounds and a speed of 60 feet per minute.



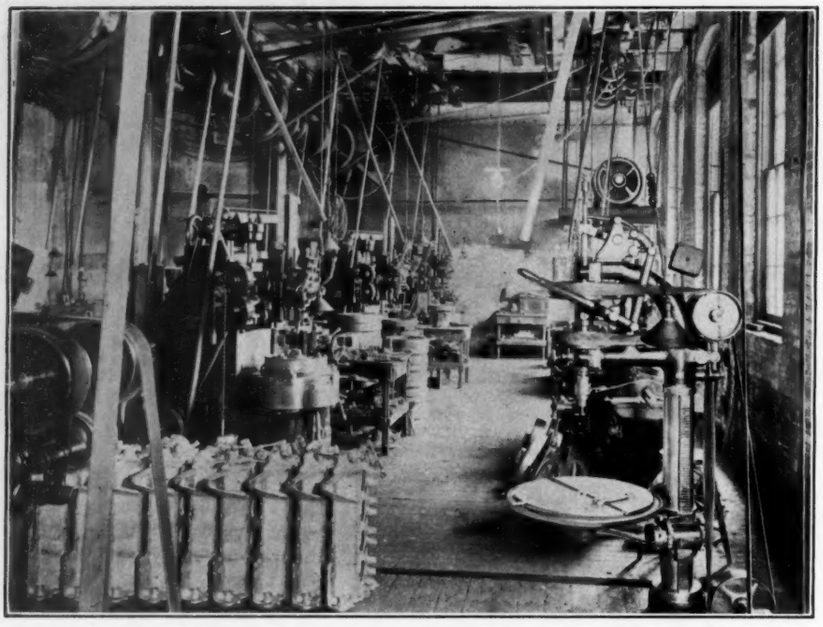
TYPICAL MOTOR INSTALLATION, SHOWING WALL PLATFORM

These have been direct-connected to 20-horsepower, 440-volt, 3 phase, 25-cycle, 720 revolutions per minute motors. There are also three elevators with 23 horsepower, 500 revolutions per minute motors, each having a lifting capacity of 5,000 pounds at 60 feet per minute. These elevators have devices in the hatchway to throw out the circuit breaker should the control fail at the top or bottom of the shaft.

Owing to the character of manufacture and plant arrangement, group drive was adopted with the exception of a very few cases. The total connected load is about 1,600 horsepower in 440-volt, 3-phase, 25-cycle, 750 revolutions per minute motors, ranging in size from 1 to 75 horsepower. Each circuit has about 150 horsepower connected.

Motors Placed on Platforms.

The direct current motors which have been replaced were set on the floor and belted to the line shaft at about 45 degrees. Owing to the amount of space required for the motor and belt, which necessarily had to be boxed in so as to eliminate possibility of accident to employes, it was deemed advisable to either suspend the new motors from the ceiling or place them on a platform. The arrangement of the tools was such that most of the group drives demand 20 to 50 horsepower. Motors of this size are not so accessible when suspended from the ceiling, neither will the ordinary ceiling permit of such an arrangement without extra reinforcement, consequently everything favored the platform installation. The ceilings average about 16 feet from the floor, and the platform clears the floor 8 feet. In some instances platforms are placed in the corners of rooms, while in others they are placed in the center or near the side wall, being suspended by one or two 1 inch iron rods placed in 2-inch pipe spacers. The platform is framed of 6-inch square pine timbers with a double layer of 2-inch planking. The platforms are large enough to allow the removal of the rotor without lowering any parts of the motor to the floor below. They also put the motors beyond the reach of all em-



Motor Drive in Heavy Machine Room.

ployes except those taking care of them.

Where the platform is located in a corner, the walls carry a portion of the weight through a projection of the frame timbers mortised into the brick work. The frame is further tied to the wall by means of lagged straps which pass through the brick work The wall platforms are very similar except that additional tie rods secure the outer corners to the wall, thus eliminating lateral vibration. Those platforms in the centers of ceilings are suspended by four bolts and are further steadied by 5/8-inch tie rods and turnbuckles which extend from each corner to the ceiling at an angle of 45 degrees to the side and surface of the platform.

In most cases the motor starter, knife switch and fuse blocks are placed immediately beneath the platform on asbestos covered planking, framed and bolted to wall. A snap switch controls a 4-light cluster underneath the platform. The function of this cluster is not only to give light at this particular location, but also indicates visibly when power is off or on.

In starting an induction motor, one of the running fuses may blow and the motor will run single phase. If left in this condition very long, one of the windings may be burned out. To detect burned out fuses, an arrangement of 2-ampere fuse wire, with about 6 feet of lamp cord leads and terminals, similar to those on a portable voltmeter, is used. By shunting this on the fuses to be tried any fuse that has blown will indicate it by blowing the 2-ampere fuse wire. This is a cheap and quick device and can be used while the motor is running.

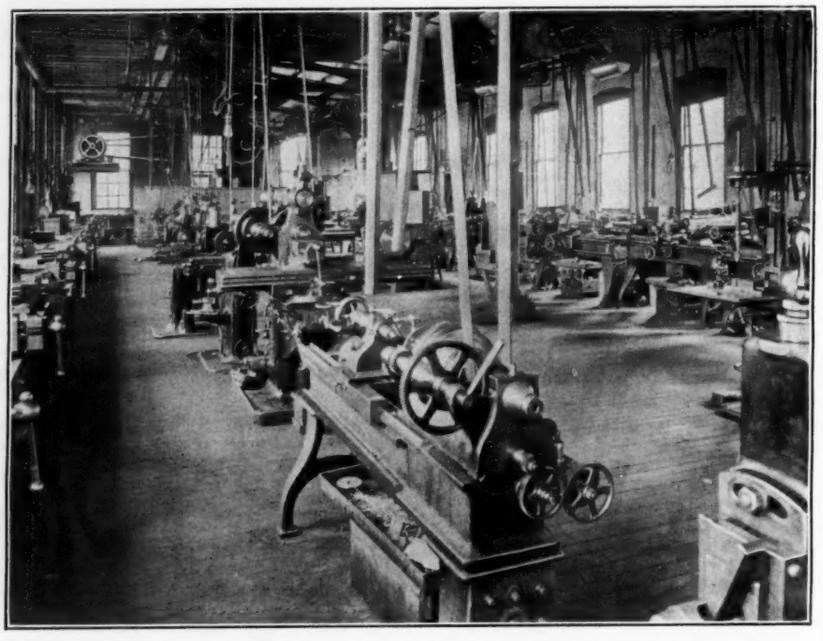
Some difficulty was experienced due to the static electricity generated by the slipping of the belt on the iron line shaft pulley. The pulley centers are 18 feet. To remove static electricity from the motors, various brush devices were tried to take it from the belts, but these soon become deranged and rendered useless from various causes. All motor frames are now grounded through about 200,000 ohms resistance made up of two 1/4 x 12-inch round graphite resistance rods which effectively remove the static charges from the motor.

Care of Motors.

Compressed air is piped in most departments to operate portable tools or to keep machine tables free from chips. Taps are taken from this general distribution system and a 3/8-inch pipe is carried in close proximity to the motors, terminating in a valve and male portion of a union to receive a hose for blowing out motors, which operation is performed once each week. Oil is changed in the bearings and the bearings are washed with gasoline every six months. Those that are in dirty places are cleaned more frequently. A portable ammeter is taken around to the motors at frequent intervals, or if a motor appears to be overloaded, ampere readings are taken. As near as is possible the motors are operated at full load. By changing motors from time to time to suit the load, the power factor and load factor are maintained reasonably high. At present the load factor is 75 per cent and power factor 82 per cent.

Electric Lighting System.

Power for lighting is distributed through 3-phase feeders from the main switchboard to the various factory buildings. Illumination is one of the most difficult electrical problems in an industrial plant, and many arrangements have been tried in the Willys-Overland works. Flaming arc lamps are used in the forge room, suspended about 20 feet from the floor, but ow-

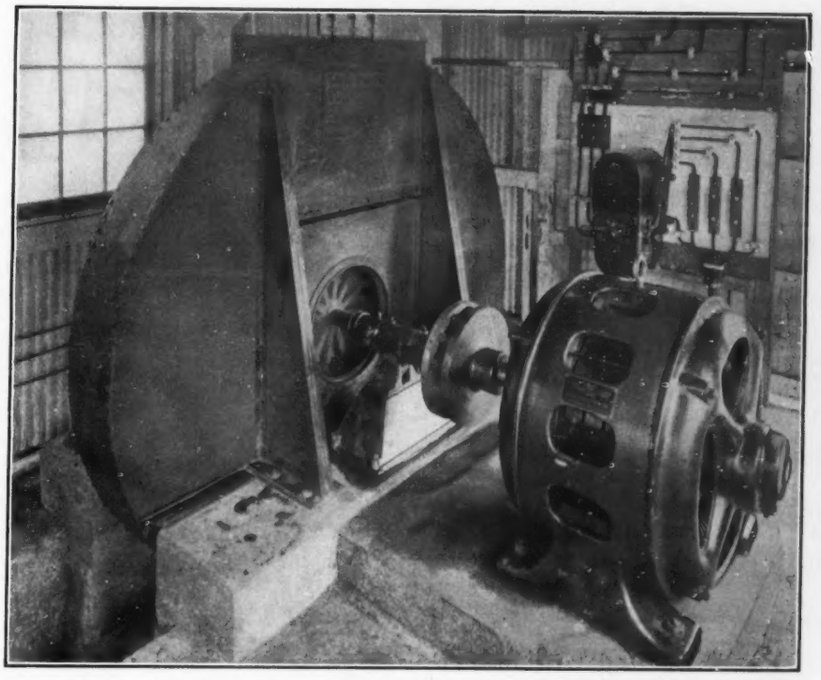


Motor Drive in the Tool Room

ing to the low frequency of the current these are not any too satisfactory, as the flicker is very noticeable. About five hundred 200 - watt incandescent lamps with frosted tips are used for general illumination, spaced from 20 to 25 feet apart with white enameled tin shades. These have proved very satisfactory and have the advantage that they may be washed without danger of breakage. Series Mazda clusters with four 100-watt Mazda lamps and white enameled steel shades suspended by a spring to take up vibration are now being tested. Common, 16-candle power carbon lamps are used at all machines and benches. These have an 8-inch cone tin shade.

There are three electric welding machines which are used to weld various parts that enter into the manufacture of an automobile. Two of these are for butt-welding and one for spot-welding. Each machine is connected across one phase of the 3-phase, 440-volt power circuit. To butt-weld ¾-inch round steel it takes from 25 to 35 seconds and an average of about 48 amperes current consumption.

The motors installed have given exceptionally good service and have been found to be liberally rated, as upon many occasions they have been heavily overloaded for long periods and heating was not noticeable. Form-wound coils in open slots are used in the motors and this feature has shown a great saving of time, inasmuch as they can be replaced in about one-third the time required for the older type and with less damage to the coil when removed. The motors are four-pole with the exception of those in three elevators and were furnished by Allis-Chalmers Co., Milwaukee. Cards bearing warnings as to live parts of circuits and manner in which the starter may be used are placed at the sides of the starters on the walls.



SEVENTY-FIVE HORSEPOWER DIRECT-CONNECTED BLOWER.

Annual Meeting of the Institute of Metals

The Institute of Metals, devoted to the study of non-ferrous metals, although the youngest of the scientific societies, is by no means the least vigorous. The annual meeting held in London, Jan. 17 and 18, furnished ample evidence that the Institute has quickly found its sphere of usefulness. One of the most interesting papers presented was prepared by Prof. H. C. H. Carpenter and C. A. Edwards, entitled "A New Critical Point in Copper-Zinc Alloys," and it was described by some of those in attendance as marking a new epoch in the study and treatment of copper. However, a keen competitor for pre-eminence at the meeting was the subject of "Copper Corrosion," especially as it relates to ship and mechanical equipment and boiler tubes.

The meeting was largely attended, and on Tuesday afternoon, Jan. 17, many of the visitors were permitted to inspect the new super-Dreadnought, Thunderer. A good deal of secrecy is maintained with regard to the equipment of these naval leviathans. The Thunderer when finished will have a displacement of 22,500 tons. On the evening of the same day the annual dinner was held J. A. F. Aspinall, responding to a toast, pointed out that copper practically dominated the program and was of the opinion that aluminum might be of great use in the construction of railway passenger cars. He said that for some time the Lancashire & Yorkshire Railway had been building the panels of these coaches of aluminum.

Business Meeting.

The business meeting of the Institute was held Wednesday morning and the report of the Council showed a membership of 551, an increase of 46 during the year. It was reported that a committee has been appointed to investigate the causes of and methods for the prevention of the corrosion of non-ferrous metals. A pathological museum of metals has been established at the offices of the Institute, comprising specimens tending to show how non-ferrous metals and their alloys might fail in use. The formation of a library has also been commenced. Officers for the ensuing year were elected as follows: President, Sir Gerard Muntz; vice presidents, Professors Carpenter, Gowland and Huntingdon; engineer, Vice Admiral H. J. Oram, Sir Henry A. Wiggin, and W. H. Johnson; treasurer, Prof. Turner, and secretary, G. Shaw Scott.

In his presidential address, Sir Gerard A. Muntz described the work of the corrosion committee as of great moment, which was likely to have far-reaching effects. He pointed out that the difficulties met with in non-ferrous metals were legion, and the causes were frequently exceedingly obscure and for this reason scientific investigations are essential in this field of endeavor.

The report of the corrosion com-

mittee was read in abstract and was discussed at length. It was pointed out that the use of iron coils in connection with tubes might afford protection against corrosion. Dr. Rosenhain considered that the size of the crystals greatly affected corrosion, coarser structures being much more liable to pitting. It had been his experience that pitting nearly always occurred in long, well-defined lines, which shows that it is not due to the water, but to some difficulty in the metal. A. E. Seaton called attention to the frequent complaints of rusting of thin steel tubes for condensing. Formerly they were made of No. 16 gage steel, but now No. 18 to No. 20 is specified. It has been found practically impossible to pass the rigid admiralty inspection with British steel, and Swedish steel is now used, as the British ores are not suitable for the manufacture of the comparatively thin steel plates of modern boilers.

A. Philip (Admiralty chemist) stated that statistical records show that 90 per cent of the corrosion of tubes was along the bottom of the tubes. The pitting described by Dr. Rosenhain, it was stated, was no doubt due to carbon particles drawn in through the water. Corrosion on the steam side of the tube he thought was often due to the presence of hydrochloric acid and possibly carbonic acid. The leakage of electricity also has an enormous influence, especially in ships. Other causes of the corrosion of tubes were charged against mechanical abrasion by steam and water, the action of air in cooling water, mechanical strains of metal in rolling and annealing, inclusion of foreign matter, etc.

A new critical point in copper-zinc alloys was discussed at length, several speakers being of the opinion that the critical point in the heating of the brass was at about 470 degrees Cent., when brittleness developed. At temperatures above and below this stage there was no brittleness and a practical effect of this critical point was shown by the exhibition of some brass wire 54 years old, which had become brittle, but after annealing at 650 to 700 degrees Cent., the brittleness was entirely removed.

Defects of Accepted Fireproof Construction

(Continued from page 320.)

to heat in the attic, rendered all the massive walls and fireproofing of the lower floors a shell and practically a firetrap. In removing the dead bodies from under the mass of twisted and wrecked steel in the basement of the Chamber of Commerce building, oxy-acetylene cutting torches were used for cutting, as illustrated in Fig. 2. The work was done under the direction of Augustine Danis Jr., of the Ohio Welding & Manufacturing Co., 828 W. Sixth street. The rapidity with which the beams were cut shows exceptionally well the value of the autogenous cutting process in work of this character.

New Catalogs

CORLISS ENGINES. — Allis-Chalmers Co., Milwaukee. Bulletin No. 1501. Describes "Reliance" type belted Corliss engines, with details of construction.

TRIPLEX PUMPS.—Aldrich Pump Department, Allentown, Pa. Bulletin No. 12-A. Devoted to Aldrich electric sinking and recovery pumps and electric track pumps.

LATHES AND DRILL PRESSES.—Joseph T. Ryerson & Son, Chicago, in two four-page bulletins, recently issued, illustrate and describe the Rockwell drill press and the Rockwell lathe.

MELTING FURNACES.—Circular No. 12, from W. S. Rockwell Co., 50 Church street, New York City, is devoted to the Rockwell stationary crucible melting furnace for gas or oil fuel.

TRACTION ENGINES.—Fairbanks, Morse & Co., Chicago. Catalog No. 119-B. Describes the Fairbanks-Morse gasoline traction engine, and illustrates its employment for plowing, hauling threshers, etc.

STEAM PUMPS.—Dean Bros. Steam Pump Works, Indianapolis, Ind. Catalog No. 83. Describes various types of boiler feeders, including vertical "Atlantic" and single horizontal plunger patterns.

AIR COMPRESSORS. — Bulletin No. 300, from the Ingersoll-Rand Co., 11 Broadway, New York City, is devoted to its class P. B. Duplex power-driven air compressors, with details of construction.

HOT BLAST STOVES.—Arthur G. McKee, Rockefeller building, Cleveland, has issued an 11-page booklet devoted to the Nelson hot blast stove, setting forth the views claimed for this construction.

ELECTRICAL APPARATUS.—Bulletin No. 25, from Fairbanks, Morse & Co., Chicago, is a catechism in direct current apparatus and contains much information of value to the average buyer of electrical apparatus.

STEEL BELT LACING.—The Bristol Co., Waterbury, Conn., is distributing Bulletin No. 152, devoted to the Bristol steel belt lacing, giving full-sized illustrations of the various sizes, with instructions for the use of each.

TRANSMISSION MACHINERY. — Catalog No. 9, Hill Clutch Co., Cleveland, 194 6 x 9-inch pages; describes a line of transmission machinery, including shafting, pulleys, hangers, bearings, clutches, cement machinery, etc.

POWER PUMPS.—Catalog H, from the Deming Co., Salem, O., 189 7 x 9¼-inch pages, deals with power pumps in triplex, centrifugal, rotary, deepwell and other types, as well as single-belt or motor-drive air compressors.

CRANES.—Catalog No. 82, 40 6 x 9-inch pages; Whiting Foundry Equipment Co., Harvey, Ill.; describes Whiting cranes, electric travelers, locomotive, gantry, jib and wall types, with a list of some of the larger users.

TUMBLERS.—Catalog No. 83, Whiting Foundry Equipment Co., Harvey, Ill., 20 6 x 9-inch pages; supersedes catalog No. 80 and is devoted to Whiting foundry tumblers, describing in detail each of the types of tumblers and cinder mills built by this concern.

FOUNDRY SUPPLIES.—Osborn Mfg. Co., Cleveland, Catalog No. 131, 240 6 x 9-inch pages. Lists and describes a full line of foundry supplies and equipment, including molding machines of various patterns, grinders, ladles, core ovens, barrows, sand mixers, brushes, etc.

CORE DRILLS.—The Ingersoll-Rand Co., 11 Broadway, New York City. Bulletin No. 9001, 48 6 x 9-inch pages. Describes the construction and use of the Calyx core drills, with numerous illustrations showing their employment in making soundings, drilling wells, prospecting, etc.

PILE DRIVERS AND LOCOMOTIVE CRANES.—The Browning Engineering Co., Cleveland, has issued a 16-page, 9 x 12-inch catalog which illustrates the Browning railroad pile driver, locomotive cranes and revolving steam shovels, with illustrations of their use.

CRANES.—Catalog No. 25, Northern Engineering Works, Detroit, 56 6 x 9-inch pages, is a condensed catalog compiled from the various bulletins issued by the company and deals with its various classes of cranes, including electric and hand travelers, pillar, jib and locomotive types.

FANS.—L. J. Wing Mfg. Co., 90 West street, New York City. Bulletin No. 7. Describes the "Typhoon" turbine blower, in which the steam turbine buckets are carried on the periphery of the fan vanes and which is designed particularly for boiler furnace draft. Bulletin No. 8 is devoted to Type-A motor driven disk fans and includes tables of dimensions, capacities, etc.

AIR COMPRESSORS AND ROCK DRILLS. —Ingersoll-Rand Co., 11 Broadway, New York City. Bulletins Nos. 3002, 20 6 x 9-inch pages, and 4109, 24 6 x 9-inch pages. Describe, respectively, the Ingersoll straight-line, single-stage air compressor, with details of construction and tables of sizes and capacities; and "electric-air" rock drills, with examples of application.

DRILLING AND TAPPING MACHINES. —The Cincinnati Bickford Tool Co., Cincinnati, have assembled under one cover, a number of 8½ x 11-inch, 4-page descriptive circulars dealing with single and multi-spindle drilling and tapping machines in sizes from 20 to 42 inches. A number of circulars on radial drills, from 2½ to 6 feet, are similarly grouped under another cover.

ELECTRICAL APPARATUS.—The General Electric Co., Schenectady, N. Y., has issued the following bulletins: No. 4810 describes a line of portable motor-driven air compressors, capacity from 15 to 100 cubic feet per minute, No. 4785 is devoted to electric drive in wood-working plants; No. 4807 to switchboard panel for small alternating current plants; No. 4809 to high voltage oil brake switch for switchboard and remote control; No. 4784 to electric drive for pulp and paper mills; No. 4804 to small and medium sized direct-connected engine type generating sets; No. 4685 to belt-driven alternating current generators; No. 4808 to a description of the electric equipment of the Washington, Baltimore & Indianapolis railway, and No. 4798 to air brake equipment for electric railway lines.

POINTERS ABOUT NEW BUSINESS

(In order to assist the post office in delivering letters to new concerns, it is suggested that the names of incorporators be written in the lower left hand part of every envelope addressed to such new companies.)

New Buyers:—

The following manufacturing companies have filed articles of incorporation:

The Orinda Stove & Mfg. Co., Quincy, Ill.; $50,000; C. H. Hurst, Henry Lange and A. H. Stork.

The Alliance Brass & Bronze Co., Alliance, O.; $15,000; Charles W. Smith and others.

The Acme Tool Co., Jennings, Mo.; $150,000; by William Klasing, Louis Klasing and F. J. Steiner.

Western Machine Mfg. Co., Eau Claire, Wis.; $40,000; by P. J. Holm, Alonzo G. Foss and John H. Holm.

The Ford Meter Box Co., Wabash, Ind.; $25,000; manufacture water meters; by E. H. Ford, T. W. and W. A. McNamee.

The Warner Mfg. Co., Toledo, O.; manufacture automobiles; $500,000; Thomas W. Warner, E. Stanton Janney, Nettie M. Warner, George D. Moore, Charles S. McCarthy.

The Phelps Iron & Steel Co., Cincinnati; $10,000; by Carlisle Murdock, Florence Murdock, Griffith Resor, Blanche Scarlett Phelps and Edward C. Phelps.

The Thatcher-Reuter Mfg. Co., Cleveland; tools, etc.; $20,000; by James C. Thatcher, Henry F. Reuter Jr., Rollie J. Shilling, William G. Smith and George F. Reuter.

The Reliance Mfg. Co., Massillon, O.; $10,000; Frank C. McLain, M. R. Bissell, John Igelstrom, F. W. Arnold and John E. McLain; manufacture hardware specialties.

The Potts-Rine Supply Co., Columbus, O.; manufacture engine supplies; $25,000; by Ben D. Potts, Harry L. Potts, Frank M. Rine, Frank Christ and L. G. Williams.

The Multiple Jet Carburetor Co., of Dayton, O.; manufacture machinery of all kinds; $10,000; John W. Raymond, Joseph Friedman, May C. Raymond, Benjamin Semmelman, Abe Semmelman and Hayden A. Kern.

The Morrin Climax Boiler Co., Jersey City, N. J.; $100,000; Thomas F. Morrin, Elizabeth T. Morrin and Thomas J. O'Day; manufacture boilers, steam generators, pipe fittings, smoke stacks, etc.

The Alberger Gas Engine Co., Buffalo, N. Y.; $221,000; manufacture and deal in engines, machinery, gas engines, boilers, etc.; by Charles H. Taylor, Louis E. R. French, Israel G. Holender and others.

New Construction:—

The Western Boiler & Pipe Co., Monmouth, Ill., is planning to begin building in February a factory and sales room at Des Moines, Ia., probably on West Ninth street.

The International Harvester Co., of Hamilton, Ont., has given out a contract for a new office building, 60 x 100 feet, two stories and basement, estimated to cost $40,000. It will be ready for occupancy June 15.

Spang, Chalfant & Co., Pittsburg, have notified tenants on the company's property on Bridge street, Etna, to vacate within 30 days. The company is planning to erect a machine shop and other buildings on the property.

The Northwestern Can Co., Chicago, has agreed with the officers of the Kenosha Industrial Association to remove its plant to Kenosha, Wis., if a suitable building can be provided. Money has been raised to provide for meeting this proposal.

The Prime Western Smelting Co., Iola, Kan., is planning to build a five-block zinc smelter between Collinsville, Okla., and Owasso. It proposes to expend $100,000 on the new works.

The United States Electrical Tool Co., Cincinnati, has applied for a permit to build a two-story brick and stone factory building at Sixth street and Mt. Hope road, at an estimated cost of $10,000.

The erection of the buildings for the proposed band mill for the Sharon Steel Hoop Co., at Sharon, Pa., has been completed by the Weimer & Harris Co., of Youngstown, O. The mill equipment is yet to be placed, and the new works will not be in operation for at least two months.

Gray-Hawley Mfg. Co., Detroit, making brass specialties for motor boats and cars, has bought a factory site on Jefferson avenue between McDougall and Elmwood avenues on which ground has been broken for a factory and a two-story brick office building.

The California Monolithic Steel Co., recently incorporated, is preparing to erect a factory at San Rafael, Cal., estimated to cost $150,000. The company recently purchased a site containing 214 acres at San Rafael. William Mooser, San Francisco, architect, has been secured to draw the plans.

The Chicago, Milwaukee & St. Paul Railway Co. is planning to establish a small foundry in Kansas City, Mo., for making journal bearings and locomotive castings. The Commercial Club of that city has been requested by the railroad company to find a site suitable for the foundry.

The Republic Iron & Steel Co. has broken ground for its proposed new general office building at Youngstown, O. The building will be six stories, 50 x 108 feet, of brick and steel construction. It will have two elevators and will be fireproof throughout. The site adjoins the present Brown-Bonnell works office.

The Automatic Tubing Co., which was recently incorporated with a capital stock of $25,000, will build shops at Menominee, Mich., for the manufacture of steel tubing by an automatic machine process patented by M. B. Lloyd. The officers are: President, J. W. Wells; vice president, M. B. Lloyd; secretary and treasurer, Edward Daniel.

The Buckeye Steel Castings Co., Columbus, O., has purchased 85 acres at Indiana Harbor, near Chicago, on which it intends to erect a new plant. Plans have not been completed but it is announced that the new plant will include one of the most completely equipped steel foundries in the west. S. P. Bush, Columbus, is president and general manager.

The General Fire Extinguisher Co., Providence, R. I., has awarded a contract for the construction of a steel and brick factory building at its Warren, O., plant. The building will be 150 x 350 feet. Part of it will be devoted to machine shops, and part to storage purposes. The machinery will

be electrically driven, and the plant will be ready to operate by May 1.

The Carroll Foundry & Machine Co., Bucyrus, O., has begun the erection of an additional machine shop, 82 x 212 feet, which will connect with the present foundry, machine shop, blacksmith shop and cleaning room, and will provide for the installation of some extra heavy tools. The shop will be modern fireproof construction, with a concrete roof. A heavy-duty traveling crane will be installed.

General Industrial:—

Joseph T. Ryerson & Son, Chicago, has certified formally to an increase in the number of directors from three to five.

The National Brass & Iron Works, Reading, Pa., has made an assignment for the benefit of creditors to Charles F. Nages.

At the recent annual meeting of the Sharon Foundry Co., Sharon, Pa., W. W. Shilling was elected president and Thomas Kennedy, secretary and treasurer. Robert McIntyre was chosen a director, succeeding T. A. Harris.

Hugh J. O'Brien, of Rochester, N. Y., has been named by a federal court receiver of the W. E. Hibbler Machine Supply Co., of Rochester, following the filing of a voluntary bankruptcy petition.

A special meeting of the Pittsburg Valve Foundry & Construction Co., Pittsburg, will be held Feb. 23 to vote on a proposed issue of preferred stock to be exchanged for common stock, share for share, not exceeding 5,750 shares.

The Reliance Iron & Engine Co., of Racine, Wis., will remove to La Crosse, Wis., where a new company has been incorporated with $200,000 capital and under the name of the Starite Engine Co. A new plant will be built for the manufacture of gasoline engines.

The Henry Vogt Machine Co., Louisville, Ky., manufacturer of boilers, ice machinery, etc., has completed an addition to its boiler department, using equipment it has had in other parts of the plant. The company reports an excellent demand for machinery, and is operating its plant over-time.

The Kentucky Wire & Iron Works, recently incorporated with $2,000 capital stock at Louisville for manufacturing wire and iron specialties, has established its plant at Fifth and Oak streets, that city. A. L. Ducker is the chief stockholder. No large improvements will be made for the present.

The following officers were elected at the annual meeting of the Eureka Foundry, Eureka, Cal.: G. Y. Henderson, president; C. W. Pickett, vice president; George W. Watson, secretary and general manager, and George W. Watson, George Y. Henderson, C. W. Pickett, Andrew Westwater and Mrs. Wrigley, directors.

Stockholders of the Andrews & Hitchcock Iron Co., Youngstown, O., recently re-elected these officers and directors: President, Frank Hitchcock; vice president and general manager, W. J. Hitchcock; secretary and treasurer, H. W. Heedy; Mrs. Louisa Andrews, Myron I. Arms and John Shaw. The company operates two blast furnaces at Hubbard, O.

Receiver T. J. Delahunt has been authorized to accept a bid of $38,000 for the property of the Rider Lewis Motor Car Co., Anderson, Ind. The bid was submitted by Attorney L. C. Manson, of Milwaukee, representing Chicago and Milwaukee men. Based on the bid, the receiver will be able to pay creditors from 12 to 15 cents on the dollar on about $160,000 general claims.

The Norwood Mfg. Co., of Norwood, a suburb of Cincinnati, has been incorporated for $10,000 by T. L. Keutz, N. B. Hadley, J. M. Morehouse, A. J. Syarr and H. B. Barnes, to manufacture window ventilators and small metal specialties. The company will shortly begin the construction of a plant and will be in the market for special metal working machines.

The annual election of the Niles Tool Co., Hamilton, O., resulted in no changes in the organization, which remains as follows: President, James K. Cullen; vice president, George T. Reiss; treasurer, Charles Cornell; secretary, Joseph Blair; assistant secretary, Lucius Potter. The statement is made that the company had a prosperous year and plans to increase its working force when the new shops are completed.

The Hunt Boiler Works, at Marinette, Wis., is experiencing probably the busiest season since its establishment. A 60-foot stack and 200-horsepower boiler have been built for the Lignum Chemical Co., on Witbeck Island, and a 90-foot stack has been delivered to the Norway Water Co., at Norway, Mich. Crews are out in various parts of the territory to make repairs on logging railways and saw millls.

Thomas Neal, of Detroit, has been chosen president of the General Motors Co., succeeding J. J. Storrow. James T. Shaw, also of Detroit, has been elected treasurer, to take office Feb. 1, while C. H. McGee has been appointed controller. Mr. Storrow will continue permanently at the head of the finance committee, which has full charge of the financial affairs of the company.

Stockholders of the Ironton Iron Co., Ironton, O., elected these directors recently: H. A. Marting, W. A. Murdock, F. L. McCauley, D. C. Davies, Dr. C. A. Lowry, E. O. Marting, W. W. Marting and Fred J. Horschell. The directors organized by choosing the following officers: President and general manager, H. A. Marting; first vice president, E. O. Marting; second vice president, W. A. Murdock; secretary and treasurer, W. W. Marting.

The Cincinnati Bickford Machine Tool Co. has just completed moving into its new plant at Oakley, O., and the old plant on Spring Grove avenue has been closed. Machine tool builders are generally experiencing a revival in sales which in turn is reacting on the jobbing foundries locally. The machine tool builders are doing more business than for some months past.

Trade Notes:—

J. C. Moyer & Co., Philadelphia, handling iron, steel, coal and coke, announce the removal of their offices to the Real Estate Trust building, Broad and Chestnut streets.

The Jobson-Hooker Co., New York City, announces the removal of its offices from 1170 Broadway to 1214-15 Madison Avenue building, 23-25 East Twenty-sixth street.

Clark Car Co., Pittsburg, balance door dump cars, announces the removal of its offices from the Frick Annex to the Henry W. Oliver building, Pittsburg. Its telephone number is Grant 2274.

The Power & Mining Machinery Co. announces the removal of its Chicago office from 1219 First National Bank building to 825 Old Colony building, effective Feb. 1. L. J. Hewes is district manager in charge of the Chicago office.

The George Whiting Co., Chicago, formerly located at 1417 West North avenue, on Feb. 1 removed its office and works to its own new commodious quarters at 1701 to 1719 Elston avenue, northeast corner of Wabansia avenue. There it has considerably more room where it proposes to increase greatly its present facilities.

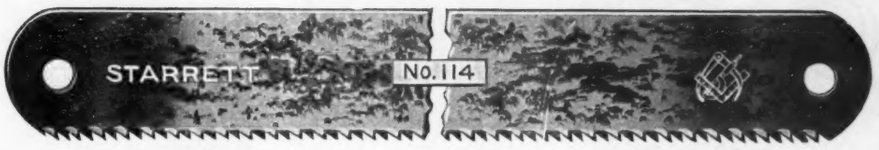
Fires:—

The office of the Ontario Iron & Steel Co., Welland, Ont., which had just been completed, was badly damaged by fire on Jan. 28.

Saws especially adapted for work in large power machines are made of the finest grade steel. The set insures a free, smooth, rapid cut--every tooth cuts--every saw the highest quality and adapted for the work intended.
Catalog No. 18OB Free.

STARRETT SAWS

"Cut Quick and Last Longer"



The L. S. STARRETT Co., Athol, Mass.

NEW YORK
132 Liberty Street

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THE COES "Key Model" WRENCH

is the finest engine room tool ever made, anywhere, by anybody, at any time.

Made of heavy steel forging, fully hardened by a special process, used by Mr. Coes for many years.

It will not batter or jam a large nut as will a chain wrench. It will not slip or make trouble and will take anything within its opening capacity, either square or hexagon.

Every Coes Wrench package bears this trade mark:

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See that you get the genuine.

YOUR DEALER HAS THE "COES."

COES WRENCH CO.
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"CYCLONE"
(Trade Mark)
High Speed Chain Hoists
½ ton to 40 tons capacity

"MOORE"
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(Trade Mark)
½ ton to 10 tons capacity

"DIRECT"
Differential Pulley Blocks
¼ ton to 3 tons capacity

"STANDARD"
Screw Chain Hoists
½ ton to 3 tons capacity

"Matchless"
ADJUSTABLE
Malleable Frame Trolleys
½ ton to 10 tons capacity

Malleable Iron Castings

Send for Complete Illustrated Catalog

40 TONS

The CHISHOLM & MOORE MANUFACTURING CO.
CLEVELAND, OHIO

The Interstate Foundry Co.
Cleveland, O.

Automobile Parts
Pipe Bells
General Grey Iron Castings

Fine Castings.

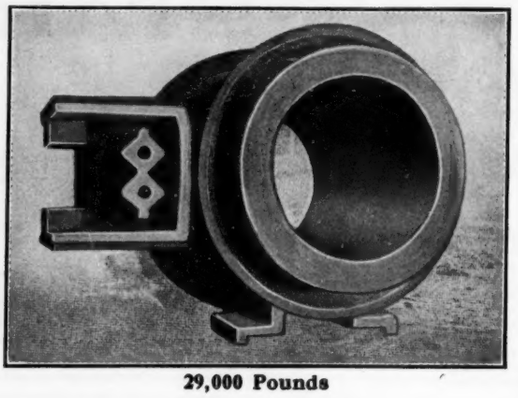
Ingot Molds
Machinery Castings
Chemical Plant Castings

IN

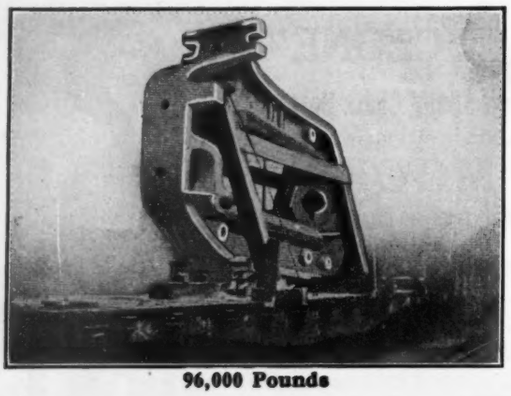
CASTINGS

there is nothing too
large for us to make

STEEL CASTINGS
from 100 to 100,000 pounds



29,000 Pounds



96,000 Pounds

OTIS STEEL

Otis Fire-Box Plates a Specialty. Flange Plates, Ship Plates, Tank Plates, Steel Axles of all kinds

Steel Castings and Forgings

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STEEL CASTINGS
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CRUCIBLE STEEL CASTINGS
AUTOMOBILE WORK SOLICITED
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MALLEABLE AND STEEL CASTINGS

BUFFALO, N. Y. (Organized 1848) BRANTFORD, CANADA

STRONG STEEL CASTINGS
The Toughest Metal Ever Produced, New Methods
You will be interested to learn that by our *improved methods* in *Acid Open Hearth Steel* manufacture, you can purchase *Genuine Steel Castings* which are *Smooth, Solid,* and true to pattern, having *Exceptional Strength* and *Ductility,* at prices below those asked for inferior steel.

STRONG STEEL FOUNDRY CO.
Main Street BUFFALO, N. Y.

MALLEABLE CASTINGS

PATTERNS MADE

Benton Harbor Malleable Foundry Co.
Benton Harbor, Mich.

ENTERPRISE METAL CO.

Syracuse, N. Y.

Manufacturers of **Babbitt and White Metal Alloys of Superior Quality**

Backed by thirty years experience.
Let us quote you and send samples.

FRAZER & JONES CO.

SYRACUSE, N. Y.

SUPERIOR MALLEABLE IRON
CASTINGS
Tumbled or Sand Blast Finish